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Utah State Innovation Model: Financial Analysis

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Contents

I. Executive Summary 3
Scope of Work and Limitations of the Analysis 4
Description of Methods 5
Key Results 6
Moving Forward 8
II. Financial Analysis of Utah's Health Care Innovation Plan 8
Financial Implications of Utah's Innovation Plan 8
III. Economic Foundations 9
IV. Analytical Method 12
Estimation of Enrollment and Expenditure Baseline 12
Simulation of ROI 17
Intervention Effectiveness 20
V. ROI Results 20
Summary of Net Savings: Subaim 1.3 (VBR) 21
Summary of Net Savings: Subaim 2.1 (POLST) 23
VI. Analysis and Assessment of Specific Subaims 24
Levers for System Change 24
Analysis of Subaim 1.3 25
Analysis of Subaim 2.1 38
VII. Scope of Work and Limitations of the Analysis 45
VIII. Technical Appendix 46
Methods and Data for Estimating the Baseline Model 46
Description of MEPS Results 55
Simulation of Cost Reductions 57
Distribution of Results 62
IX. Bibliography 66

I. Executive Summary

Through the State Innovation Model (SIM) Initiative, the Centers for Medicare and Medicaid Services (CMS) provided funding to 25 states to support the development and testing of state-based models for multi-payer payment and health care delivery system transformation. In 2013, Utah was selected as a recipient of a SIM Design grant and committed to developing an Innovation Plan to improve Utah's health system performance by increasing quality and lowering costs. Its plan consists of four specific Aims:

- Aim 1: Adapt and perform well in a value-based purchasing (VBP) environment (value = quality outcomes / cost)
- Aim 2: Facilitate end-of-life preferences for Utah citizens with dignity, respect, and efficiency
- Aim 3: Increase access to primary care and behavioral health
- Aim 4: Create community-clinical linkages and healthful environments

Each of these Aims is divided into Subaims, through which a series of interventions will be implemented. The interventions are essentially sub-steps intended to guide the transformation of the health system environment. The Utah Department of Health contracted with Leavitt Partners, and its subcontractor Notalys, to provide a financial analysis and return on investment (ROI) calculations on two Subaims and their corresponding interventions:

- Subaim 1.3: To have 80% of Utah's covered lives involved in a Value-Based Purchasing and Reimbursement plan (VBR).
    - Intervention 1.3.1: Convene a group to formulate a set of outcome metrics that can be used to determine value in health care, which can be measured by data collected from payers or providers
    - Intervention 1.3.2: Establish a test comparing VBP systems by recruiting three groups of payers and/or providers using different VBP systems
    - Intervention 1.3.3: Accelerate VBP efforts through the use of the All-Payer Claims Database
    - Intervention 1.3.4: Provide technical support to individuals, small providers/clinics, and public health to ensure ability to utilize VBP data and to ensure that new care coordination, case management, and care transition codes are fully utilized

- Subaim 2.1: To have 50-60% of Utah patients diagnosed with a serious terminal illness have a Physician Order of Life Sustaining Treatment (POLST) on file electronically (ePOLST) and to have 25% of Utah adults (age 19+) complete an Advance Directives form
    - Intervention 2.1.1: Develop and enhance health IT-enabled tools and assess their impact to support increasing the number of Utahns that have completed the appropriate end-of-life forms

- Intervention 2.1.2: Teach providers how to have crucial conversations around end of life, POLST, and Advance Directives

The contract for these analyses was awarded on Oct. 28, 2013. The final product, represented by this report, will be included in part in the Utah Department of Health's State Health Care Innovation Plan provided to CMS.

Scope of Work and Limitations of the Analysis

Scope of Work

This financial analysis considers the effects of two Subaims associated with the State Innovation Model. As contracted, our analysis includes the following components:

- An estimate of the size of any populations affected by the intervention, particularly the sub-populations covered by Medicare, Medicaid, CHIP, and the uninsured
- An estimate of the total costs to the State as a per member per month (PMPM) figure for each population affected by the intervention
- A description of the type of anticipated costs from the intervention and the level of cost improvement anticipated for each affected or targeted population
- A calculation of the total amount of expected savings and the associated ROI

Limitations

This analysis is limited to evaluating the impact the Innovation Plan has on the State's health care system and the costs to the State from implementing the Plan. However, innovations and interventions undertaken by the State will produce important consequences that are beyond the scope of this inquiry. These include (but are not necessarily limited to):

- The value of health outcomes
- Industry profits or losses
- Costs to third parties
- Other administrative and political costs

In addition, due to the short time frame for completing the project, it was necessary to make several broad assumptions about both the data used in the financial analyses and the parameters used in the models. As such, the specific results of the analyses should only be considered within the context of the assumptions outlined in the report. Further, the primary goal of this report is to produce a methodology the State can use in future financial analyses conducted for its Health Care Innovation Plan, rather than exact point savings and ROI estimates. As the State moves forward with its Plan, and is able to refine assumptions and select more targeted data sources over time, the methodology outlined can be used to produce more precise results.

Description of Methods

The Baseline Model

The following approach was used in developing the methodology and baseline model. First, the Utah population was subdivided into *enrollment groups.* An enrollment group is a sub-population defined by a payer category (Medicare, Medicaid & other state-run plans, private insurers, and the uninsured) and a plan category (fee-for-service (FFS), managed care, or VBR). Second, these enrollment groups were used to develop a *Baseline Model,* which consists of the following two parts:

- *Estimates of the number of persons and the associated health care expenditures for each group for the years 2007–2013.* These estimates were developed using best data sources, including a combination of federal data sources (principally the National Health Expenditure Accounts and estimates from the Medical Expenditure Panel Survey) and state data sources. Where data were not yet available, we employed a variety of methods to estimate enrollments and expenditures (these methods are further discussed in the technical appendix). In each case, the effort is to capture total, actual expenditures rather than claimed amounts. Estimates include, where possible, out-of-pocket expenses.

- *Projection of future enrollments and costs for each enrollment group (2014–2018).* These values are based on historic data as it exists. Specific estimates for Utah are based either on state analyses or inferred from national health care projections, such as those completed by the Congressional Budget Office (CBO) and CMS.

The Aim Simulation Model

Once the values of the baseline model were determined, we developed an *Aim Simulation Model*. This complex model consists of applying multiple simulation parameters associated with a given Subaim that shifts the values in the baseline model up or down, based on the effects of the interventions. The objective is to estimate the future flow of expenditures associated with undertaking the Subaim and compare them with baseline expenditures.

A central part of the analysis is determining the range of reasonable values to use for each parameter in the model. Determining these values is the focus of the intervention analysis (Section VI), where each of the Subaim's interventions are assessed in terms of the effects they are likely to have on the Subaim. The range of values is based on parameter values found in the literature. In all cases, it is our attempt is to apply values that are justifiable given the research, but to be conservative in our assessment of how successful the interventions are likely to be. More detailed information on the intervention analysis and the assumptions used to determine the range of values for each parameter is provided in Section VI.

Because we were tasked with assessing a set of new interventions that have not yet been tried in the State, and for which relatively little data exists nationwide at this time, the most reasonable approach was to develop a range of values for each simulation parameter and then report a range of results for the estimated returns on investment. Using a Monte Carlo Simulation approach allows us to take random draws from the population thousands of times to generate a distribution of outcomes in which all the parameters vary freely within their assumed ranges.

Key Results

Figures 1.1 and 1.2 show the estimated per-capita net present value savings from achieving each Subaim. The net savings for each Subaim is the difference between projected baseline spending and the projected spending that would occur under a scenario where the Subaim is achieved. These net savings are cumulated over 3-year and 5-year periods, and then put into *per-capita, net present value terms.* The results can also be converted to ROI format by dividing the savings by the amount expected to be spent by the State for achieving each Subaim.

ROI = (net savings from achieving the Subaim) / (cost of the Subaim)

The ROI calculations are presented in Section V. The range of simulated values is presented in the Appendix.

Figure 1.1: Per-Capita Savings from Subaim 1.3 (VBR)

	3-yr NPV per person	5-yr NPV per person	Percentiles (5-yr NPV per person)		
Population	*Mean*	*Mean*	*25th*	*50th*	*75th*
Total	$ 332	$ 1,151	$ 840	$ 1,152	$ 1,467
Medicare	$ 287	$ 1,066	$ 474	$ 1,069	$ 1,664
Medicaid	$ 256	$ 949	$ 449	$ 956	$ 1,452
Dual-Eligible	$ 1,589	$ 5,435	$ 1,145	$ 1,579	$ 2,024
CHIP	$ 48	$ 182	$ 125	$ 176	$ 238
Private	$ 363	$ 1,232	$ 836	$ 1,240	$ 1,636

The State's plan to transform the health care economy by moving towards a VBR system has the potential to generate very large returns on investment for the State. It is expected that the State will save an average total of $332 per person over a 3-year period (or roughly $110 per year, per person).[1]

[1] As noted in the limitations section, we incorporate here only State spending as part of the Innovation Plan—not other spending by the state or spending by other parties.

The highest potential gains are, naturally, among those with the highest level of spending—those eligible for both Medicare and Medicaid.

After five years, the State is expected to save an average of $1,151 per person. The difference between these two time periods is due to the implementation process. The simulation model assumes that the initial year (2014) will be primarily devoted to continued development and implementation of the plan, and year two will involve only small savings. It is only the third year that significant reductions in savings are allowed to occur.

Even modest success at achieving the goal of transitioning to a value-based environment can result in significant gains. Simulation results show that gains at the 25th percentile yield very significant returns on spending for the State. This is because interventions within the plan, such as the improvement of the All Payer Claims Database (APCD), have potential to reach significant, system-wide results on health care spending in Utah (see Section VI for more detail).

Figure 1.2: Per-Capita Savings from Subaim 2.1 (POLST)

	3-yr NPV per person	5-yr NPV per person	Percentiles (5-yr NPV per person)		
Population	*Mean*	*Mean*	*25th*	*50th*	*75th*
Total	$4.00	$6.99	-$2.67	$7.39	$16.73
Medicare	$19.74	$34.27	-$32.00	$37.95	$101.72
Medicaid	$1.09	$1.88	-$1.76	$2.07	$5.60
Dual-Eligible	$3.08	$5.34	-$5.11	$5.89	$15.89
CHIP	$0.15	$0.26	-$0.25	$0.28	$0.77
Private	$1.12	$1.92	-$1.81	$2.12	$5.71

Reforms on end-of-life spending are likely to generate fewer financial savings to the State than moving to a VBR system. It is expected that the State will save an average total of $4 per person over a 3-year period (or roughly $1.33 per year, per person). Available research shows that having Advance Directives in low-spending areas, such as Utah, have little effect on end-of-life spending, and some research suggests that these directives can actually *increase* spending. Furthermore, according to the *Dartmouth Atlas of Health Care,* the intensity of treatment at the end of life in Utah is far less than in high-spending states. The recent innovation of the POLST form may be more effective, but there is no solid scientific evidence we can yet point to regarding its cost-effectiveness (obviously use of these forms provide much value beyond costs, but evaluating that value is beyond the scope of this report).

Moving Forward

The methods described above can be expanded in three important ways:

- The *data* used in developing the baseline model can be *expanded and updated* and as better data becomes available.
- As the State develops pilot projects or narrows the focus of its innovation efforts, the *expenditure level data within an enrollment group can be expanded* to include different categories of health care expenditures or further subdivisions of the population, such as age or gender.
- *Alternative or refined parameter ranges can be employed* in the simulation model as new information becomes available on the effectiveness of different interventions.

Detailed information of the methodology, assumptions, results, and next steps is provided in the full report below.

II. Financial Analysis of Utah's Health Care Innovation Plan

Financial Implications of Utah's Innovation Plan

Through stakeholder engagement and research, the State of Utah specified a set of Aims, or goals, related to health care system reform for its State Innovation Model. These Aims are multi-faceted and work towards a fundamental transformation of the Utah health care system. This analysis focuses on two central parts of the larger plan:

> Subaim 1.3: To have 80% of Utah's covered lives involved in a Value-Based Purchasing and Reimbursement (VBR) plan
>
> Subaim 2.1: To have 50-60% of Utah patients diagnosed with a serious or terminal illness have a Physician Order of Life Sustaining Treatment (POLST) on file electronically (ePOLST) and to have 25% of Utah adults (age 19+) complete an Advance Directives form

Utah's Innovation Plan has distinctive features that are highly relevant for financial analysis. First, the plan does not subject participants in the health care system to new legislative or executive mandates. The hallmark of the plan is *voluntary participation*.

The second feature of the plan is that it addresses *system-wide reform,* such as the effort to move the State towards VBR payment systems. In other words, the plan seeks to create an environment for reform rather than articulating focused pilot projects or testable innovations (though those may develop as a result the innovation process).

These high-level, system-wide reforms require an analytical strategy that is also system-wide, rather than an analysis which focuses on narrow populations, employers, geographic areas, diagnostic groups, or spending categories (such as in-patient care, drugs, laboratory costs, etc.). Because the State Innovation Plan does not yet incorporate specific details that would allow us to identify changes in spending among narrowly-defined groups or categories, our modeling approach consists of simulating spending outcomes at relatively high levels of aggregation.

As the State develops more specific innovations that can be more finely targeted, this analysis can be expanded to accommodate the inclusion of additional variables and assumptions. For example, pilot programs are currently underway in various places in the State. Should particular pilot programs become part of the Innovation Plan, the population groups and effects targeted by such programs can be incorporated into the analysis.

III. Economic Foundations

While the data analysis and modeling used in calculating the ROI for each Subaim is complex, the financial analysis is built on a simple economic foundation. State interventions to create health system reform fall into two main categories of state actions: expenditures and policy.

Interventions that might increase or decrease programmatic expenditures encompass a wide variety of reforms, including the improvement of the state-administered health information systems, or the provision of training materials to providers. The total cost of the state interventions is provided in the State Innovation Plan and serves as the denominator of the ROI calculation, as seen in Figure 3.1.

Interventions that change policy will alter the rules and regulations of the health care marketplace, which will in turn change the behavior of marketplace participants (i.e., consumers, providers, and payers). For example, the State could change the APCD reporting requirements for medical providers, which would change the way they report their claims.

The behavioral responses of market participants in turn affect outcomes within the health care system. The categories of market outcomes that are relevant to this financial analysis include:

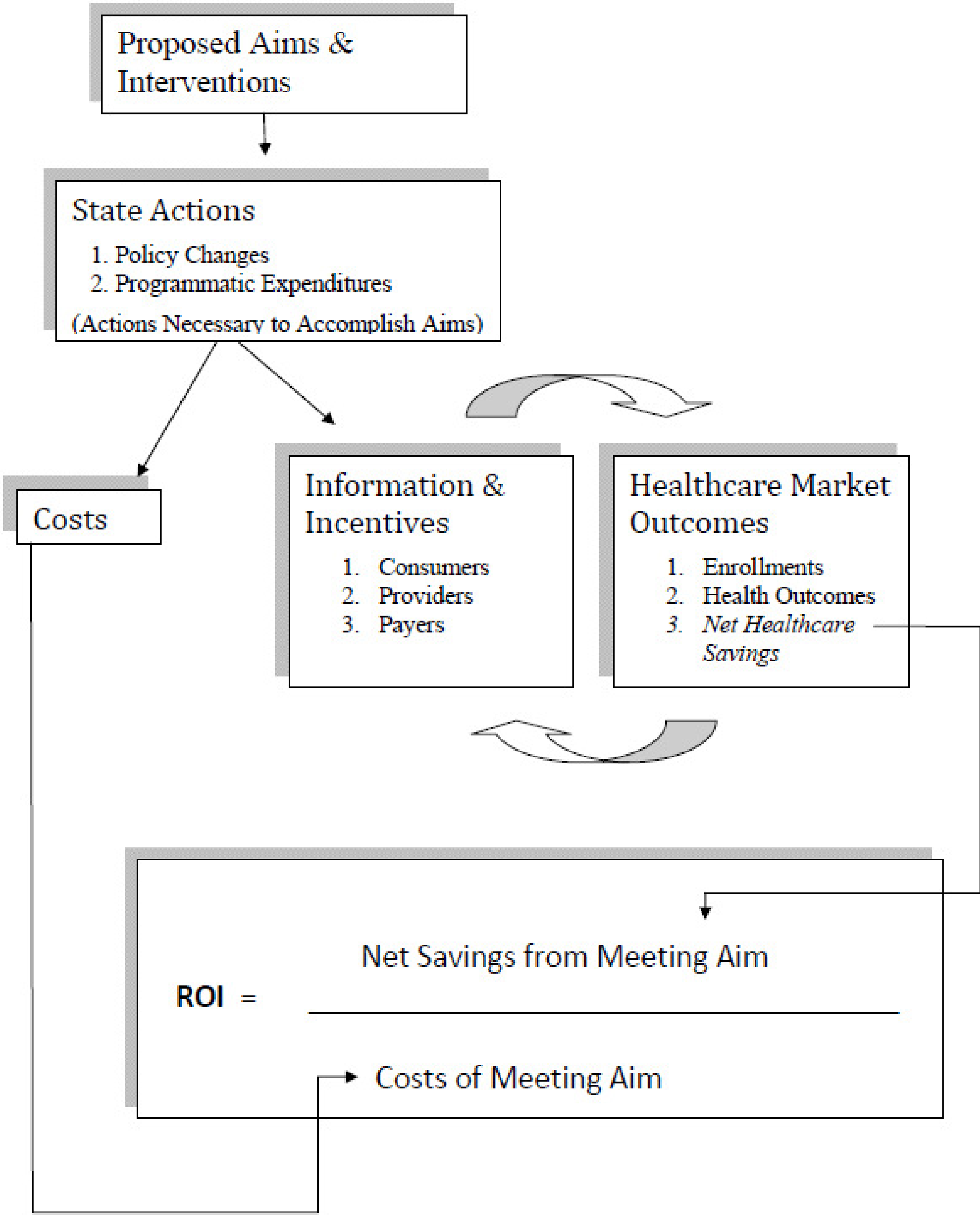
- Program/ Plan Enrollments: Consumers choose between health care plans based on differences in plan prices, benefits, and what is available in the market. They also move between private and public insurance as eligibility requirements for public programs change. In addition, consumer choice is dependent on demographic and economic characteristics. The impact of the proposed interventions on the number of consumers enrolled in the three main categories of plans (i.e., FFS, managed care, VBR) for the public insurance programs (i.e., Medicare, Medicaid, and CHIP) is a central element of the ROI analysis.

- Health Outcomes: The quality and effectiveness of health care impacts the health of consumers. The health outcomes of consumers are calculated using a variety of measurements, including days spent in the hospital and hospital readmission rates. Some of these improved outcomes are reflected in lower expenditures. (As noted elsewhere, our analysis does not monetize effects of the State Innovation Plan on health outcomes.)

- Health care Expenditures: As consumers, payers, and providers respond to increasing access to information and changing financial incentives, health care expenditures will change. Changes in expenditures are a result of changes in the number of medical services consumed and changes in the price of each service. The change in health care expenditures is the numerator of the ROI (see Figure 3.1).

It is important to note that changes in market outcomes will impact financial incentives. For example, information about the effectiveness of medical procedures will increase demand for the most effective procedures, which will drive up its price. Higher prices will then suppress the quantity of those procedures demanded by consumers. The intervention (increased access to information) changes market outcomes (greater demand for effective medical procedures), which in turn changes financial incentives (increased price for effective medical procedures), which again alters market outcomes (suppressed demand for effective medical procedures). This feedback loop between “Incentives and Information” and “Health care Market Outcomes” is illustrated in Figure 3.1 and is incorporated into our analysis.

Figure 3.1: Returns on Investment from Health System Innovations, Economic Schematic



IV. Analytical Method

Estimation of Enrollment and Expenditure Baseline

To estimate the effect of each Subaim on the health care expenditures of the populations considered in the analysis, a Core Enrollment/Expenditure Model (CEEM) was constructed. The CEEM consists of two inter-related components: enrollment and expenditures. The foundation of the CEEM is to estimate the recent and projected values that would occur in the absence of the State Innovation Plan. This part of the CEEM is referred to as the "Baseline Model."

The Enrollment Component. To develop the enrollment component, the state population is divided into mutually-exclusive enrollment groups according to payer type and plan type. An enrollment group consists of a payer (such as Medicaid) and plan type (such as FFS).

This process involves the following steps:

1. Creating enrollment groups according to Payer-Plan designations within the State.
    a. Payers include Medicare, Medicaid, Utah Children's Health Insurance Program (CHIP), Primary Care Network of Utah (PCN), Utah's High-risk Pool (HIP Utah), private insurance, and the uninsured.[2]
    b. Each Payer is then divided into subsets according to three designated plan types: FFS, managed care, and VBR. These three types or designations of plans were specifically selected to enable the assessment the State's success with achieving an 80% VBR coverage rate (Subaim 1.3).
    c. Each Payer-Plan designation creates an enrollment group. For example, Medicare is a Payer and within Medicare there are people enrolled in traditional Medicare, Medicare Advantage and Medicare Accountable Care Organizations (ACOs). Each of these Medicare subsets was assigned to one of the three plan types in order to create Payer-Plan designations or enrollment groups: Medicare-FFS, Medicare-Managed Care, or Medicare-VBR.

2. Determining the number enrolled (using either available enrollment data or estimation) for each enrollment group. Enrollment values are included for the years 2007–2013, which inform the process for projecting enrollments and expenditures in the future (2014–2018).

3. Using available data and existing research to identify the factors that determine the number of people in each enrollment group.

[2] Additional payers exist in the Utah market, but for this analysis we focused on these market-dominant payer categories.

4. Projecting changes in the size of each enrollment group from 2014–2018. Projection methods are specific to each enrollment group, though they often rely on parameters and assumptions common to several groups (see Simulation of ROI section below for more information).

Dividing the State into enrollment groups involves many simplifying assumptions and the use of data from multiple sources. These are discussed more fully in the sections below and in the Technical Appendix.

The Expenditure Component. Steps in this component are as follows:

1. Identifying (either through available data or through estimation) the expenditure levels by enrollment group for 2009–2013. Expenditures in the CEEM are aggregated to the system level, rather than specifying expenditures by category (hospitalization, out-patient physician services, prescription drugs, mental health expenditures, etc.). As specific interventions are developed by the State, these expenditure totals can be disaggregated to the category level, where appropriate category-level data can be used to evaluate the impact of specific actions at various locations.

2. Projecting changes in the size of each enrollment group from 2014–2018. Projection methods are specific to the enrollment group, though often rely on parameters and assumptions common to several groups (see Simulation of ROI section below for more information).

Assumptions and Methodology

It is important to note that enrollment groups are a necessarily simplified version of the State's health care economy. In the model, individuals belong to only one enrollment group, when in reality people sometimes have access to multiple sources of payment and move frequently between enrollment groups. The CEEM therefore represents an estimate of average expenditures during the year for each enrollment group. A main focus of the model is to distribute expenses across the State is to make sure total enrollment figures match the population and that growth in enrollment matches the projected growth in population.[3]

The designation of plan type also constitutes a significant simplification of the real health care economy. As mentioned above, our methodology includes categorizing plan types into three basic categories: 1) FFS; 2) managed care; and 3) VBR. For the purposes of analysis, the FFS plans include PPO plans, since most PPOs have minimal if any managed care component. The managed care category includes a large number of different types of plans with varying levels of active management. The VBR category consists of managed care plans that have the following characteristics:

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[3] Because of Utah's high fertility rate, Utah's age distribution in recent years has been remarkably stable. Because of this, changes in expenditures due to an aging population over the 5 year window we are analyzing are not incorporated in this analysis.

- Providers have at least some risk-based reimbursement for serving a defined population
- Coordinated care
- Compensation based, at least in part, on provider adherence to quality of care metrics

The State's plan is to reform payment systems so that more Utah lives are covered by VBR. Some of the savings from this plan will result from people moving into VBR-payment plans. But significant gains can also be made from efforts which move people away from traditional FFS plans into managed care plans, even if they do not fully qualify as VBR plans.

The model is also calibrated to match total expenditure levels for the State as a whole, as reported by CMS. While enrollment levels across different insurers are tracked quite closely by the State and published in the Insurance Department's annual report, expenditures are not similarly available at the state level. As such, we use state-level expenditures when available (such as for Medicaid and CHIP), and federally reported numbers for Medicare. Private expenditures are *not* based on a summation of data from private insurers and providers because such data are not publicly available. Instead, gross expenditure data in the private market are estimated as the total health care spending in the State (as reported by CMS) minus the publicly-funded expenditures.[4]

A complete listing of data sources and a description of methods is provided in the Technical Appendix. In estimating the baseline model, multiple data-related limitations are present. The first of these is a lack of public micro-level data for Utah. Since 2007, Utah has been collecting data into APCD. Data in the current APCD are not complete enough to estimate total spending for specific enrollment groups. Furthermore, there is not currently a person-level identifier that can be used to create total persons covered in each plan type. And the APCD captures primarily *billed amounts* rather than actual expenditures.

A key part of our analysis is allocating expenditures across managed care and FFS plans. To accomplish this, the Medical Expenditure Panel Survey (MEPS) is used, which allows us to predict the ratio of spending across plan types for each payer group (Medicare, Medicaid, and Private Spending). Total expenditures are divided across plan categories in the State based on regression estimates (see Technical Appendix) and using Utah-based demographic data from the Behavioral Risk Factor Surveillance System (BRFSS). While the BRFSS data for Utah is a valuable source of data, it does not contain expenditure data. It can, however, be used as a source for the number of uninsured in the State and participation in different types of plans.

[4] It is important to note that is calculation provides an estimate of private market costs and does not capture 100% of total funding. For example it does not explicitly account for other payment sources, such as local public health programs, behavioral health, corrections and charitable care. However, it does provide a reasonable proxy for this report.

Results

The results of the CEEM's estimations are shown in the following two figures. Figure 4.1 contains enrollment figures for each enrollment group and Figure 4.2 contains expenditure levels in per member per year (PMPY) averages for each enrollment group.

Figure 4.1: Baseline Model - Enrollments

Insurer	Category	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Medicare	FFS	159,598	150,983	144,200	143,188	145,919	181,239	178,006	183,923	189,841	195,759	201,676	207,594	213,511	219,429
	MC	42,279	57,667	68,987	77,222	86,364	84,589	86,709	89,591	92,474	95,356	98,239	101,121	104,004	106,887
	VBR	0	0	0	0	0	0	7,776	8,034	8,293	8,551	8,810	9,068	9,327	9,585
	ALL	201,876	208,650	213,188	220,410	232,283	265,827	272,490	281,549	290,608	299,666	308,725	317,784	326,842	335,901
Medicaid	FFS	25,119	25,954	28,070	34,188	41,354	38,467	38,981	46,673	49,925	52,040	53,886	55,153	56,573	57,959
	MC	142,340	147,072	159,063	179,485	188,390	201,952	204,652	245,032	262,105	273,209	282,904	289,554	297,009	304,286
	VBR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ALL	167,458	173,026	187,133	213,673	229,744	240,419	243,633	291,705	312,030	325,249	336,790	344,707	353,582	362,246
Dual-Eligible	FFS	22,298	23,046	23,548	24,345	25,657	28,447	28,015	28,526	29,037	29,547	30,058	30,569	31,079	31,590
	MC	5,230	5,406	5,524	5,711	6,018	6,673	6,859	6,984	7,109	7,234	7,359	7,484	7,609	7,734
	VBR	0	0	0	0	0	0	1,224	1,246	1,268	1,291	1,313	1,335	1,358	1,380
	ALL	27,529	28,452	29,071	30,056	31,675	35,120	36,098	36,756	37,414	38,072	38,730	39,388	40,046	40,704
CHIP	FFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MC	24,747	35,060	40,742	42,068	37,700	37,936	38,935	10,254	10,382	9,878	8,415	7,344	7,350	6,427
	VBR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ALL	24,747	35,060	40,742	42,068	37,700	37,936	38,935	10,254	10,382	9,878	8,415	7,344	7,350	6,427
PCN	FFS	17,795	18,505	24,103	14,946	16,780	16,960	17,387	17,684	17,981	18,278	18,575	18,872	19,169	19,466
	MC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VBR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ALL	17,795	18,505	24,103	14,946	16,780	16,960	17,387	17,684	17,981	18,278	18,575	18,872	19,169	19,466
HIPUtah	FFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MC	3,505	3,621	3,839	4,158	4,337	4,379	4,501	4,583	4,665	4,747	4,829	4,911	4,993	5,075
	VBR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ALL	3,505	3,621	3,839	4,158	4,337	4,379	4,501	4,583	4,665	4,747	4,829	4,911	4,993	5,075
Private	FFS	596,016	649,732	702,332	640,999	642,454	648,704	716,515	729,575	742,636	755,697	768,757	781,818	794,879	807,939
	MC	1,357,870	1,324,456	1,247,743	1,147,766	1,199,909	1,211,582	1,338,231	1,362,625	1,387,018	1,411,412	1,435,805	1,460,198	1,484,592	1,508,985
	VBR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ALL	1,953,886	1,974,188	1,950,075	1,788,765	1,842,363	1,860,286	2,054,746	2,092,200	2,129,654	2,167,108	2,204,562	2,242,016	2,279,470	2,316,924
Uninsured	FFS	217,001	225,791	272,637	460,207	432,896	394,359	266,978	253,532	239,024	232,256	228,122	227,222	224,286	222,491
	MC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VBR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ALL	217,001	225,791	272,637	460,207	432,896	394,359	266,978	253,532	239,024	232,256	228,122	227,222	224,286	222,491
Total	FFS	2,613,798	2,667,293	2,720,788	2,774,283	2,827,778	2,855,287	2,934,768	2,988,263	3,041,759	3,095,254	3,148,749	3,202,244	3,255,739	3,309,234
	MC	0	0	0	0	0	0	9,000	9,281	9,561	9,842	10,123	10,404	10,685	10,965
	VBR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ALL	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Figure 4.2: Baseline Model – Expenditures (PMPY)

Insurer	Category	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Medicare	FFS	$ 6,588	$ 7,039	$ 7,221	$ 7,508	$ 7,966	$ 8,328	$ 8,929	$ 9,349	$ 9,854	$ 10,534	$ 11,324	$ 12,230	$ 13,086	$ 14,106
	MC	$ 6,878	$ 7,349	$ 7,539	$ 7,839	$ 8,317	$ 8,695	$ 9,322	$ 9,760	$ 10,287	$ 10,997	$ 11,822	$ 12,768	$ 13,661	$ 14,727
	VBR	$ 6,522	$ 6,968	$ 7,148	$ 7,433	$ 7,886	$ 8,244	$ 8,839	$ 9,255	$ 9,754	$ 10,427	$ 11,210	$ 12,106	$ 12,954	$ 13,964
	ALL	$ 6,649	$ 7,125	$ 7,324	$ 7,624	$ 8,097	$ 8,445	$ 8,799	$ 9,213	$ 9,711	$ 10,381	$ 11,159	$ 12,052	$ 12,895	$ 13,901
Medicaid	FFS	$ 8,048	$ 8,217	$ 8,295	$ 8,723	$ 8,852	$ 9,103	$ 9,503	$ 10,596	$ 11,444	$ 12,279	$ 13,065	$ 13,888	$ 14,832	$ 15,856
	MC	$ 5,601	$ 5,719	$ 5,773	$ 6,071	$ 6,161	$ 6,335	$ 6,614	$ 7,375	$ 7,965	$ 8,546	$ 9,093	$ 9,666	$ 10,323	$ 11,036
	VBR	$ 5,601	$ 5,719	$ 5,773	$ 6,071	$ 6,161	$ 6,335	$ 6,614	$ 7,375	$ 7,965	$ 8,546	$ 9,093	$ 9,666	$ 10,323	$ 11,036
	ALL	$ 5,968	$ 6,094	$ 6,151	$ 6,496	$ 6,645	$ 6,778	$ 7,076	$ 7,890	$ 8,521	$ 9,143	$ 9,729	$ 10,341	$ 11,045	$ 11,807
Dual-Eligible	FFS	$ 21,725	$ 21,165	$ 23,929	$ 24,910	$ 26,455	$ 27,592	$ 29,751	$ 31,150	$ 32,832	$ 35,097	$ 37,729	$ 40,748	$ 43,600	$ 47,001
	MC	$ 22,681	$ 22,096	$ 24,982	$ 26,006	$ 27,619	$ 28,806	$ 31,060	$ 32,520	$ 34,276	$ 36,641	$ 39,389	$ 42,541	$ 45,518	$ 49,069
	VBR	$ 20,527	$ 19,997	$ 22,609	$ 23,536	$ 24,995	$ 26,070	$ 28,110	$ 29,431	$ 31,020	$ 33,160	$ 35,647	$ 38,499	$ 41,194	$ 44,407
	ALL	$ 21,907	$ 21,342	$ 24,129	$ 25,118	$ 26,676	$ 27,823	$ 28,991	$ 30,354	$ 31,993	$ 34,201	$ 36,766	$ 39,707	$ 42,486	$ 45,800
CHIP	FFS	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	MC	$ 1,383	$ 1,494	$ 1,645	$ 1,812	$ 1,834	$ 1,938	$ 2,058	$ 2,175	$ 2,319	$ 2,472	$ 2,591	$ 2,658	$ 2,815	$ 3,032
	VBR	$ 1,383	$ 1,494	$ 1,645	$ 1,812	$ 1,834	$ 1,938	$ 2,058	$ 2,175	$ 2,319	$ 2,472	$ 2,591	$ 2,658	$ 2,815	$ 3,032
	ALL	$ 1,383	$ 1,494	$ 1,645	$ 1,812	$ 1,834	$ 1,938	$ 2,058	$ 2,175	$ 2,319	$ 2,472	$ 2,591	$ 2,658	$ 2,815	$ 3,032
PCN	FFS	$ 4,664	$ 4,871	$ 5,031	$ 5,167	$ 5,363	$ 5,551	$ 5,701	$ 6,134	$ 6,496	$ 6,853	$ 7,216	$ 7,678	$ 8,193	$ 8,709
	MC	$ 4,653	$ 4,859	$ 5,018	$ 5,154	$ 5,350	$ 5,537	$ 5,686	$ 6,119	$ 6,480	$ 6,836	$ 7,198	$ 7,659	$ 8,172	$ 8,687
	VBR	$ 4,653	$ 4,859	$ 5,018	$ 5,154	$ 5,350	$ 5,537	$ 5,686	$ 6,119	$ 6,480	$ 6,836	$ 7,198	$ 7,659	$ 8,172	$ 8,687
	ALL	$ 4,664	$ 4,871	$ 5,031	$ 5,167	$ 5,363	$ 5,551	$ 5,701	$ 6,134	$ 6,496	$ 6,853	$ 7,216	$ 7,678	$ 8,193	$ 8,709
HIPUtah	FFS	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	MC	$ 6,386	$ 5,798	$ 7,390	$ 7,951	$ 8,416	$ 7,397	$ 7,856	$ 8,304	$ 8,852	$ 9,436	$ 9,889	$ 10,146	$ 10,745	$ 11,572
	VBR	$ 6,386	$ 5,798	$ 7,390	$ 7,951	$ 8,416	$ 7,397	$ 7,856	$ 8,304	$ 8,852	$ 9,436	$ 9,889	$ 10,146	$ 10,745	$ 11,572
	ALL	$ 6,386	$ 5,798	$ 7,390	$ 7,951	$ 8,416	$ 7,397	$ 7,856	$ 8,304	$ 8,852	$ 9,436	$ 9,889	$ 10,146	$ 10,745	$ 11,572
Private	FFS	$ 5,540	$ 5,734	$ 5,817	$ 5,770	$ 6,048	$ 6,302	$ 6,636	$ 7,159	$ 7,603	$ 8,033	$ 8,469	$ 9,017	$ 9,630	$ 10,244
	MC	$ 4,050	$ 4,192	$ 4,252	$ 4,218	$ 4,421	$ 4,607	$ 4,851	$ 5,233	$ 5,557	$ 5,872	$ 6,191	$ 6,591	$ 7,039	$ 7,488
	VBR	$ 4,050	$ 4,192	$ 4,252	$ 4,218	$ 4,421	$ 4,607	$ 4,851	$ 5,233	$ 5,557	$ 5,872	$ 6,191	$ 6,591	$ 7,039	$ 7,488
	ALL	$ 4,504	$ 4,699	$ 4,816	$ 4,774	$ 4,988	$ 5,198	$ 5,473	$ 5,905	$ 6,271	$ 6,626	$ 6,985	$ 7,437	$ 7,943	$ 8,449
Uninsured	FFS	$ 1,441	$ 1,504	$ 1,541	$ 1,528	$ 1,596	$ 1,663	$ 1,751	$ 1,890	$ 2,007	$ 2,120	$ 2,235	$ 2,380	$ 2,542	$ 2,704
	MC	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	VBR	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	ALL	$ 1,441	$ 1,504	$ 1,541	$ 1,528	$ 1,596	$ 1,663	$ 1,751	$ 1,890	$ 2,007	$ 2,120	$ 2,235	$ 2,380	$ 2,542	$ 2,704

Simulation of ROI

Interventions to the state health care system should result in shifting enrollments and expenditures away from baseline trends over time. For each enrollment group, a set of cost shifters are identified and applied to the baseline trend for each enrollment group. The *net savings* from these cost-shifters, or interventions, is the difference between that new, intervention-induced curve and the baseline expenditure curve. Savings accumulate over time if the interventions lead to persistent differences from baseline levels.

The CEEM ultimately allows for the estimation of savings that result from two important consequences: 1) people moving between enrollment groups; and 2) the expenditures associated with one or more enrollment groups changing.

Conceptually the procedure for calculating the Subaims' impact on expenditures using the CEEM includes the following steps:

1. Projecting baseline expenditures in the State for each enrollment group if no health system reform takes place and aggregate those expenditures to the sub-population level for the years 2014–2018. (This is the baseline model, discussed above.)
2. Projecting the movement of the population between enrollment groups as a result of achieving the Subaim.
3. Projecting any change in per-person expenditure within each enrollment group as a result of achieving the Subaim.
4. Calculating the total expenditures across each sub-population as a result of achieving the Subaim.
5. Calculating the increase or reduction in expenditures for each sub-population in terms of PMPM as a result of achieving the Subaim.
6. Calculating the total ROI of accomplishing the Subaim for the entire State.

A mathematical presentation of the calculation of ROIs makes the conceptual process discussed above more explicit. The following terminology is used, where each value is indexed by enrollment group *j:* and year *t*:

- N_{jt}: The number of people in a group (See Table 1)
- E_{jt}: Expenditures in each group on a PMPY basis (See Table 2).
- θ_{it}: Enrollment adjustment factor
- B_{jt}: *Total* Expenditures for each group in a year
- δ_{ijt}: The amount expenditures are shifted for each group due to the jth cost-adjustment factor
- C_k: The budgetary cost of pursuing the Subaim *k* (assumed to occur in year 0)
- ρ: The annual discount rate

Cost-adjustment factors (δ_{ijt}) are developed as part of our analysis to model how interventions affect the overall Subaim. Each Subaim is associated with one or more adjustment factors used to capture costs. Each adjustment factor represents the amount that different interventions (or components of interventions) are assumed to shift baseline expenditures. Enrollment adjustment factors (θ_{it}) represent the movement of people into enrollment groups. For instance, over time individuals move from FFS plans into managed care plans, or the plans they are in adopt characteristics that would classify them as managed care.

The trend in enrollment numbers by enrollment group is given as:

$$N_{jt} = \left(1 + \theta_{jt}\right) N_{j(t-1)}$$

Baseline Expenditures are:

$$B_{jt} = N_{jt} E_{jt}$$

And net savings in a given year for each enrollment group is given by the product of the baseline expenditures and the cost-adjustment factors:

$$S_{jt} = \prod_{i} \left(1 - \delta_{ijt}\right) B_{jt}$$

The return from investing on Subaim *k* is calculated in present value terms as:

$$ROI_k = \frac{1}{C_k} \sum_{j} \sum_{t} S_{jt} \, (1 + \delta)^{-t}$$

In summary, the ROI is calculated as the net savings that result from system reform divided by the cost to the State of implementing the reform or the *net savings per dollar spent by the State*.[5] These savings are calculated, summed, and reported for each enrollment group in the model on a 3-year and 5-year basis (see Section V).

Calculating ROIs for sub-populations, such as those on Medicare, is a simplified version of the formula above where only enrollment groups within the Medicare system are considered and costs of the interventions are scaled to incorporate those that can be attributed to that population. Investment costs are funds allocated by the State to the ROI. For analytical simplicity, we assume that these costs are in present value terms.

[5] As noted in the Limitations section, we incorporate here only State spending as part of the Innovation Plan—not other spending by the state or spending by other parties.

A Simulation-Based Method

The process described above can be used to obtain point estimates of ROI, which is the primary goal of the analysis. However, given the uncertainty associated with forecasting the ROI of the proposed interventions at this time, a more useful exercise is to report the results of the analysis in a simulation framework, where key parameters—which are the enrollment-adjustment factors (θ_{it}) and the cost-adjustment factors (δ_{ij})—are allowed to vary with a defined range. *A central part this work involved informing our judgments about reasonable ranges for the key parameters in the model (see Intervention Effectiveness section below and Section VI for more detail).*

There are multiple uncertainties involved with estimating future health care costs. First, because of the lack of Utah-specific projections, the baseline expenditure model used in the analysis is a function of recent state-level cost trends that grow at rates forecasted by CBO and CMS (depending on the enrollment group). Our baseline model projections also incorporate, where possible, changes in federal and state policy, such as reforms to the state Medicaid system and the impact of the ACA.

Second, there is neither sufficient data nor sufficient scientific knowledge to determine with precision the effect the State's interventions will have on future expenditures. This is because forecasting future expenditures is *always* complex and highly uncertain as well as because the SIM process is about developing *new* approaches (approaches for which there are many promising ideas but relatively little scientific evidence).

Assumptions and Methodology

As noted above, we identify a set of cost-adjustment factors that are influenced by the interventions and then, based on the literature and our own estimation methods, identify a reasonable range of values for those parameters. This range includes a specification of minimum and maximum effects, as well as our judgment of the modal value.

Once the parameter ranges have been identified, we conduct a Monte Carlo simulation to determine the distribution of net savings. This consists of taking a series of random draws from the parameter distributions for each δ_{ijt}. Each random draw results in a shift in the baseline trend and a net savings value that can be calculated for each enrollment group. We perform 100,000 replications of this process and derive from it a distribution of 100,000 values for the ROI associated with each Subaim. We report the mean of the distribution as our primary point estimate of ROI, but also include percentiles of the savings distribution that results from the Monte Carlo process.

Complete details on the adjustment factors simulated in the model are provided in the technical appendix. In each case, we apply a triangle distribution, which is a common distributional assumption used in simulations when only limited or no sample data is available. It allows the specification of minimum, maximum, and modal values without requiring more specific distributional knowledge, such

as the standard deviation. The simulations are conducted using the *Crystal Ball* software package, the industry standard for spreadsheet-based simulation tools.

In sum, the reported ranges from the Monte Carlo simulation analysis allow a large number of uncertain parameters to be summarized in a single distribution of likely outcomes. This is a highly flexible and highly adaptable process. Assumptions about the cost-shifting parameters can be easily modified as new evidence becomes available and the distribution of savings is re-estimated. It also mitigates the highly uncertain nature of the forecasting process. The relative importance of different cost-shifting parameters can be easily determined by examination of the distribution of net savings that results from the simulation process.

Intervention Effectiveness

As directed by the UDOH, the main purpose of the financial analysis is to assess how achieving the Subaims will result in health care savings. But a related goal of the analysis is to provide critical feedback to State policymakers on the role that the specific interventions will have with respect to accomplishing the plan's Aims. As such, the analysis includes a qualitative assessment of the interventions based on how they will alter the incentives and information in the system (and hence the economic outcomes).

A thorough review of existing research on the effectiveness of the different interventions and the likely impacts that they will have was also conducted. To the extent possible, the analysis assesses the magnitude of the effects of each intervention on the Subaim; those assessments inform the range of values estimated for Subaim effectiveness that are incorporated into the simulation methodology (see Section VI for more detail). Independent assessments of the costs for each intervention in the plan are not provided in this analysis.

V. ROI Results

The projection model forecasts a level of spending for each Enrollment Group each year. The difference between this projected level and the baseline trend is the net savings in a given year. We discount these savings at a 3% rate and then sum them over periods of 3 years and 5 years to calculate net present values (NPV). The net savings are presented in three ways:

- *Per-capita savings:* This is the simple NPV for the Subaim as a whole. The NPV is calculated for each enrollment group.

- *ROI:* These are the net present value of returns that have been divided by the stated budgeted expenditures for each Subaim. According to the Innovation Plan, the planned cost of Subaim

1.3 is $4.085 million, and the planned cost of Subaim 2.1 is $2.1 million. These values are divided proportionally across the enrollment groups.

- *Annual percentage savings:* This reflects the present value of net savings in terms of the annual percentage reduction from the baseline trend.

Each of these measures relies on the same projected savings for each year; thus, the three measures are different ways of presenting the same net savings figures. Additionally, because health care is a multi-billion dollar industry in Utah, small changes in planned costs (which are just a fraction of that total) have very large effects on estimated ROIs. Similarly, while the percentage savings may appear to be small, because total spending is so large, even small percentage reductions in expenditures can result in total savings that are significantly greater than the costs of implementing the Subaim.

In general, the analysis shows savings are much larger in the 5-year timeframe than the 3-year timeframe. This is because the simulation model assumes that the initial year (2014) will be primarily devoted to continued development and implementation of the plan, and year two will involve only small savings. It is only the third year that significant reductions in savings are allowed to occur.

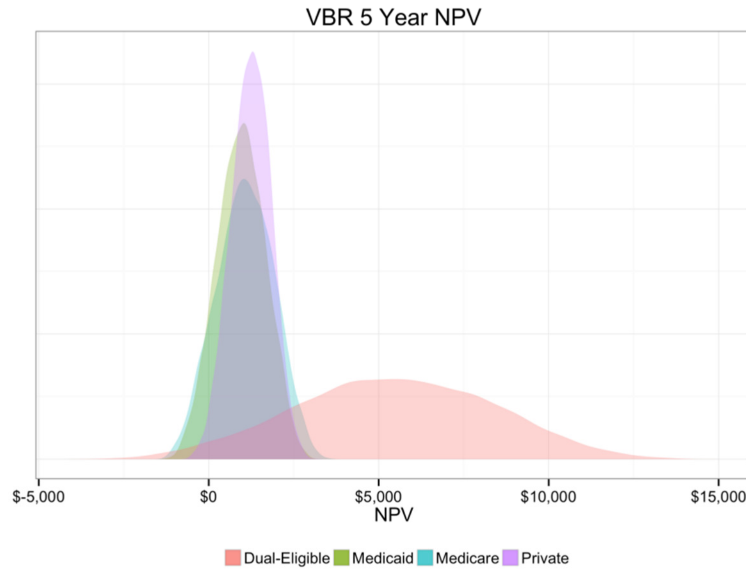
Also, it is important to stress that the simulation results are highly sensitive to the parameters of the model. Alternative sets of assumptions will yield different, sometimes significantly different values. The simulation parameters and their distributions are given in the Technical Appendix, as is more detail on the distribution of savings.

Summary of Net Savings: Subaim 1.3 (VBR)

The interventions targeted at moving the State towards 80% of covered lives in a VBR environment have the potential for significant savings for the State.[6] Figure 5.1 represents the simulated distribution of the 5-year NPV for four of the major sub-populations: Medicare, Medicaid, Dual-eligible, and private plans.

[6] As noted in the limitations section, we incorporate here only State spending as part of the Innovation Plan—not other spending by the state or spending by other parties.

Figure 5.1: 5-Year NPV, Subaim 1.3 (VBR)



The notable characteristics of these simulated distributions are that they are significantly positive and high variance. In other words, the dominant share of potential outcomes has positive savings. This is true for each of the populations (and for the total population as a whole, which includes all payers).

The variance of outcomes is wide as well. This is not surprising because of the highly uncertain returns from the proposed interventions. The distributions are based on plausible values, but the wide variance of outcomes reveals the uncertainty associated with intervention effectiveness (for more information see Section VI). The savings for dual-eligible individuals is particularly wide, which reflects the high baseline costs associated with this group. Figure 5.2 summarizes each of the three net savings measures used in this report.

Figure 5.2: Net Savings Over 3-Year and 5-Year Periods, Subaim 1.3 (VBR)

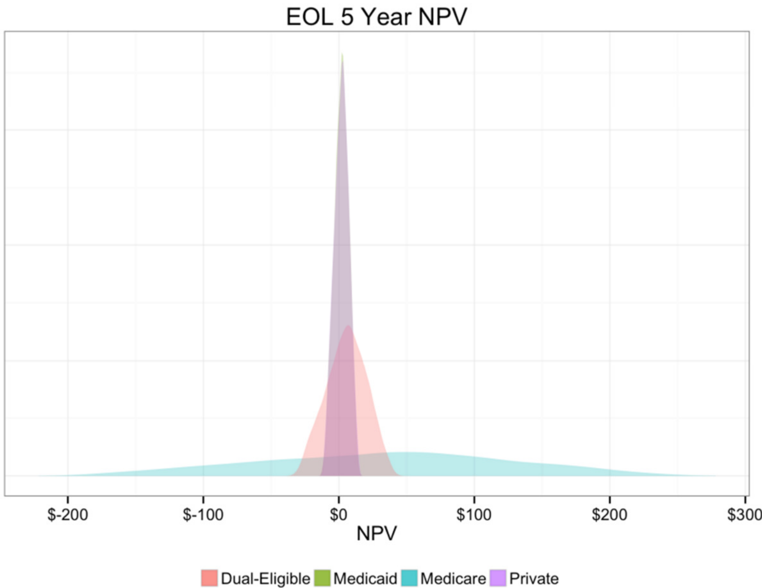
	Per-capita Savings		ROI		% Saved Annually	
	3-yr	5-yr	3-yr	5-yr	3-yr	5-yr
Population	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*
Total	$332	$1,151	239	827	1.6%	3.2%
Medicare	$287	$1,066	207	766	1.0%	2.0%
Medicaid	$256	$949	184	682	1.0%	2.1%
Dual-Eligible	$1,589	$5,435	1,142	3,905	1.6%	3.1%
CHIP	$48	$182	34	131	0.7%	1.5%
Private	$363	$1,232	261	885	1.9%	3.8%

As indicated in the table, it is expected that the State will save an average total of $332 per person over a 3-yr period (or roughly $110 per year, per person). The highest potential gains are, naturally, among those with the highest level of spending—those eligible for both Medicare and Medicaid. After five years, the State is expected to save an average of $1,151 per person.

Summary of Net Savings: Subaim 2.1 (POLST)

The distribution of net present values for a wider adoption of Advance Directives and POLST orders is given in Figure 5.3.

Figure 5.3: 5-Year NPV, Subaim 2.1 (POLST)



This Subaim has markedly different distributions of savings than Subaim 1.3. We note three important features of these results below. First, the mean value for all groups is small. As discussed in Section VI, there is little evidence for positive effects of end-of-life orders and the range of reported estimates is small. This is particularly true in low-spending states with low intensity of end of life, both of which describe Utah. Second, the mean effect and the variance differ across groups. The effect of achieving this Subaim is most noticeable in the Medicare distribution, but this group also has the widest range of effects. Third, the distribution shows significant ranges of negative returns. While those are not the most likely effects, they are possible.

It is likely that the effects in the Medicare population are stronger because the mortality rate is much higher among the Medicare beneficiaries, not because cost-savings per death are greater or that POLST orders are more effective for this group. Indeed, the percentage reduction in costs per death is

assumed to be higher in the younger age groups. However, death is much less common for those under age 65. These results are further augmented by the youthfulness of Utah's population. Cost ratios between end of life and other health care costs were calibrated using national ratios, but Utah-specific mortality rates were applied to calculate the results.

Figure 5.4: Net Savings Over 3-Year and 5-Year Periods, Subaim 2.1 (POLST)

	Per-capita Savings		**ROI**		**% Saved Annually**	
	3-yr	5-yr	3-yr	5-yr	3-yr	5-yr
Population	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*
Total	$4	$7	4	7	0.01%	0.01%
Medicare	$20	$34	21	36	0.07%	0.07%
Medicaid	$1	$2	1	2	0.00%	0.00%
Dual-Eligible	$3	$5	3	6	0.00%	0.00%
CHIP	$0	$0	0	0	0.00%	0.00%
Private	$1	$2	1	2	0.01%	0.01%

As indicated in the Figure 5.4, it is expected that the State will save an average total of $4 per person over a 3-yr period (or roughly $1.33 per year, per person).

It is quite possible that the new generation of POLST orders will have a greater effect on end-of-life care than has occurred through previous efforts, but this has yet to be demonstrated. The modest effects seen for this Subaim reflect those previous experiences. More effective interventions in the future may push savings into the upper range of the distribution.

VI. Analysis and Assessment of Specific Subaims

Levers for System Change

Health care reform interventions are only successful if they lead to behavioral changes in actors participating in the health care system: consumers, employers, providers, and payers. As such, the success of interventions can be evaluated in terms of how likely they are to change behavior, and through which pathway.

As noted above, the development of parameters used in the financial analysis model involves assessing the relative impact of the different interventions used to accomplish the Subaims. As part of this assessment, we analyzed the levers accessed by each of the interventions. Five fundamental levers

have been identified that effect behavior within the health care system. Specific actions (expenditure or policy changes) have the effect of pulling one or more of these levers:

- Lever 1: Provide Information and Training. The State has the ability to collect health care industry information and share it with participants. It can also provide training to participants. Oftentimes markets provide information and training without government action, but in the case where markets fail to provide transparent information, government actions can perform a crucial role. Governments can also require the public release of privately held information (see Lever 5 below).

- Lever 2: Facilitate Coordination. Sometimes coordination by industry competitors can lead to various forms of collusion and even violation of ant-trust laws, but other types of coordination benefit both the health care system and consumers. Governments can facilitate coordination by convening stakeholders and providing forums for discussion.

- Lever 3: Exert Market Pressure. Governments take a variety of actions that affect markets, including the purchase of goods and services. Government is already heavily involved in the provision and purchase of health care, which heavily influences quantities and prices in health care markets. The provision of new information (Lever 1) can promote transparency in the health care market place, which facilitates market competition and exerts downward pressure on prices.

- Lever 4: Establish Voluntary Standards. In most industries, there are common standards that promote efficiency for the industry as a whole. Sometimes these standards are developed through natural market forces, but governments can also take an active role in establishing standards, such as a common set of health care quality metrics.

- Lever 5: Enact and Enforce Regulations. Changes in legal requirements are the most direct way to change behavior. While the Utah State Innovation Model Plan does not include new regulations, the State's health care system is being influenced by many changes mandated by the ACA and other State health care reforms, including the creation of the APCD.

Analysis of Subaim 1.3

Value-Based Payment and Reimbursement Systems: Definitions and Key Elements

Defining value-based payment and reimbursement systems is crucial for the implementation of Subaim 1.3 and its associated interventions. Developing baseline estimates in terms of moving toward the goal of 80% of covered lives in VBR plans requires a strict definition for what qualifies as VBR. Unfortunately, no such definition has been widely conceded by health care experts in government or industry. At best,

we can identify certain elements of value-based payment methods and define a general philosophy for what value-based payment seeks to accomplish.

VBR strives to reward value as opposed to volume in health care. Four elements may contribute to that goal:

1. *Coordinated Care*. As discussed previously, managed care systems provide a mechanism by which utilization can be better matched to patient needs. Gatekeeper physicians act as efficiency agents, ensuring that all treatments are merited and efficient in reaching positive health outcomes and patient satisfaction.

2. *At-Risk Contracting*. Providers should bear some risk in order for payment reform efforts to be realized. As providers bear financial risk for the health care decisions they make with their patients they are incentivized to reduce waste and increase efficiency.

3. *Defined Population*. Risk should be attached to a defined population. Providers are in a better position to manage care and costs across a population than with individual patients.

4. *Quality Based Payment Rates*. The 1990s HMO model was met with public fear that doctors would no longer be making medical decisions for their patients. It is critical that VBR reforms avoid eliciting such fears. As providers are incentivized to lower costs through at-risk contracting arrangements they must also be incentivized to maintain or increase care quality. If payment rates are based, at least in part, on quality metrics, providers are incentivized to balance cost savings and quality of care.

The Cost-Effectiveness of Traditional Managed Care

A significant part of the financial gains from the State Innovation Plan will occur from moving people into traditional managed care plans. This movement generates gains even without more recent innovations in health care delivery, such as the adoption of quality metrics.

Numerous studies conclude that managed care results in decreased health expenditures relative to FFS or traditional health plans. Some of the estimated results are quite substantial. In Hellinger's 1996 review of studies comparing managed care and FFS, almost all the studies reviewed (including randomized trials, same-disease studies and same-physician studies) found significantly lower spending and utilization under managed care.[7] A 1987 study of the RAND health insurance experiment, which randomly assigned patients to HMO or FFS providers, found that spending was 28% lower and days in the hospital were 41% less for patients assigned to an HMO.[8]

[7] Hellinger 1996.
[8] Manning et al.1987.

A study published in 1989 compared persons randomly assigned to a health plan either with or without a gatekeeper to specialists. Gatekeepers shared in surplus or were held partially responsible for deficits from an individual risk sharing account based. Cost of enrollees in gatekeeper plans were 6% less than for non-gatekeeper plans.[9] A 1987 study published in the journal *Pediatrics,* examined data from a trial that randomly assigned physicians in a pediatric clinic to receive a fee per visit or a capitated PMPM payment. Physicians paid on a fee per visit basis had 22% more visits per patient than physicians paid on a PMPM basis.[10] Not all studies reveal positive results, however; in a 1969 trial that randomly assigned employees from three companies to an HMO or FFS plan, hospital use for HMO enrollees was lower but ambulatory care was higher, with a slightly higher cost of care for HMO enrollees.[11]

Several studies attribute differences in spending to lower reimbursement rates by managed care plans. A 2000 study in the Rand Journal of Economics that compared the treatment of heart disease in HMOs and FFS insurance plans found that the HMOs had 30% to 40% lower expenditures with nearly all the spending differences attributable to lower unit prices (little difference in treatments or health outcomes).[12] A 2004 study by health economists Polsky and Nicholson found the large differences in expenditures between HMO and non-HMO plans were largely attributed to relatively low provider reimbursement rates paid by HMO plans.[13] In a 2003 study utilizing MEPS data, researchers at the Urban Institute found that, after adjusting for risk, if the average privately insured low-income adult were switched to Medicaid coverage, spending would be 7% or 16% lower (depending on whether utilization rates were estimated jointly or separately for the privately insured and Medicaid recipients), while switching a low-income adult from Medicaid to private insurance would result in an 18% or 40% increase in spending. The researchers attributed most of the change in expenditures to differences in provider payment rates.[14]

Managed care has also been found to create cost savings by reducing hospital costs, specifically by discouraging the acquisition of new technologies. A 2008 study published in the Journal of Health Economics concluded that managed care had a negative impact on hospitals' adoption of new technology, especially less profitable technology. They also found that an increase in the managed care market share leads to long-term reductions in medical cost growth.[15] Economists Cutler and Sheiner found, in their 1998 study, that HMOs reduced hospital cost growth by reducing acquisition of new technologies, suggesting that HMOs had the potential to reduce the long-run growth of medical spending.[16]

Several studies examined the potential cost savings of managed care within Medicaid. In 2006, The Lewin Group synthesized 14 studies on the savings achieved when states implemented Medicaid

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[9] As cited in Hellinger
[10] Hickson, Altemeier, and Perrin 1987.
[11] Perkoff, Kahn, and Haas 1976; Perkoff, Kahn, and Mackie. 1974.
[12] Cutler, McClellan, and Newhouse. 2000.
[13] Polsky and Nicholson 2004.
[14] Hadley and Holahan 2003/2004.
[15] Mas and Seinfeld 2008.
[16] Cutler and Sheiner 1998.

managed care programs.[17] Researchers concluded that nearly all studies demonstrated a savings from the managed care setting, with estimates of savings ranging from 2% to 19%.[18] Many studies showed noteworthy savings with respect to the SSI-related population, inpatient utilization, and pharmacy costs. For example, a California study found that the rates of preventable hospitalization were 38% lower in managed care than in FFS plans for the Temporary Assistance for Needy Families (TANF) populations and 25% lower in managed care for SSI populations.[19] And a comparison of drug costs for the TANF population in multiple states found that the PMPM cost of drugs in the managed care setting was 10% to 15% lower than in the FFS setting.[20]

However, a 2013 study published in the Journal of Policy Analysis and Management found that a large increase in the percentage of Medicaid recipients enrolled in HMOs during the 1990s and 2000s did not reduce Medicaid spending nationally, and may have even increased Medicaid spending, particularly for risk-based HMOs. However, the findings did suggest that for states with relatively generous Medicaid reimbursement (compared to private reimbursement); shifting to managed care did achieve cost savings.[21]

Finally, a 2013 study by Maxim L. Pinkovskiy of the Federal Reserve Bank of New York estimated that the managed care “backlash” of the 1990s, which restricted HMOs use of cost-cutting measures, increased the U.S. health care share of GDP by 2 percentage points (relative to no backlash). This 2 percentage point increase accounts for much of the growth in the health care share of GDP since the health care cost growth stagnation of the 1990s.[22]

A New Focus on Value

By moving to a VBR system, Subaim 1.3 targets problems associated with volume-based payments. As a fundamental goal, the Subaim seeks to realign payment and value, defined by both cost and quality of care. By shifting the incentive from volume to value, Subaim 1.3 hopes to reduce or maintain costs while increasing quality of care across the State.

The problems associated with volume-based payment systems have been thoroughly documented.[23] Research suggests that increased services or increased expenditures do not necessarily increase health care outcomes.[24] As such it is crucial that VBR innovations lead to better alignment between cost and quality of care.

Several payment models have recently been piloted across the country with mixed results. A 2009 study in the Journal of the American Medical Association investigated the effect of care coordination

[17] The Lewin Group 2004.
[18] Ibid.
[19] Center for Health Care Strategies 2004.
[20] The Lewin Group 2003.
[21] Duggan and Hayford 2013.
[22] Pinkovskiy 2013.
[23] Baicker and Goldman 2011; Robert Wood Johnson Foundation 2013.
[24] Fisher et al., 2003.

on hospitalization, quality of care, and health care expenditures.[25] Researchers conducted randomized trials using 15 coordinated care programs in which eligible Medicare patients were assigned to a control group (usual care) or a care coordination treatment group. The results concluded that "Viable care coordination programs without a strong transitional care component are unlikely to yield net Medicare savings. Programs with substantial in person contact that target moderate to severe patients can be cost-neutral and improve some aspects of care." (p.603)

A 2012 working paper by CBO also showed mixed results. The CBO evaluated four Medicare demonstration projects on value-based payment and found that only one program showed any significant savings to the Medicare program.[26]

Other studies have shown small to modest gains to value-based payment reforms. A 2006 literature review by The Lewin Group suggests that Medicaid managed care reforms (a step toward VBR) yielded small but measureable savings.

Because of the mixed literature on the returns to VBR system reforms, it is critical that the interventions in Subaim 1.3 are evaluated not only in terms of their acceleration of the proliferation of VBR health plans, but also for their effectiveness in reaching the ultimate aims of reducing costs and increasing quality.

Summary of Intervention Effectiveness

In the following subsections we discuss each of the 4 interventions related to Subaim 1.3. Each intervention is assumed to reduce the obstacles that create barriers to reaching the goal of 80% of covered lives in VBR plans. The five levers discussed on page 25 act as the mechanisms through which each intervention is expected to cause change in the system. The following matrix illustrates the levers that each intervention is expected to impact.

[25] Peikes et al. 2009
[26] Nelson 2012.

Figure 6.1: VBR Interventions Effectiveness Matrix

	INT 1.3.1 VBR Comparison Test	INT 1.3.2 Standardized Value Metrics	INT 1.3.3 All Payer Claims Database	INT 1.3.4 Data Use and Technical Support
Provide Information and Training	X		X	X
Facilitate Coordination		X	X	X
Exert Market Pressure	X		X	
Establish Voluntary Standards		X	X	
Enact and Enforce Regulation			X	

Intervention 1.3.1 – Establish a test comparing VBR systems by recruiting three groups of payers and/or providers using different VBR systems.

As the State seeks to create an environment in which VBR systems can flourish it will be important to identify the models that most effectively reduce costs and maintain or increase quality. The following sections outline several VBR reform efforts that have been piloted across the country.

Patient-Centered Medical Homes. Several studies have shown that patient centered medical homes reduce expenditures and improve quality. A medical home model in rural northeastern Pennsylvania found a 7.1% savings in medical expenditures.[27] A health plan in Flint, Michigan showed that increased access to primary care reduced emergency department visits (51%) and hospitalizations (15%).[28] Other studies range from 1.5%[29] to 14.5%[30] for individual populations served by medical home programs.

Bundled Payment. Bundled payment systems strive to incentivize providers to collaborate across specialty areas to reduce the wide variation in costs for specific episodes of care. One study showed that some inpatient procedures varied in costs by between 49% and 103%. The researchers concluded that bundling payments would reduce this variation and thereby yield "sizeable savings."[31]

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[27] Maeng et al. 2012.
[28] Klein and McCarthy 2010.
[29] Dentzer 2012.
[30] Raskas et al. 2012.
[31] Miller et al. 2011.

Estimates suggest that if Medicare reimbursement rates were set to bundle at the median cost for 17 specific episodes of care, the system would save $4.7 billion annually.[32] Medicare demonstration projects showed a 10% reduction in costs for coronary artery bypass graft procedures due to bundled payment systems,[33] as well as hospitals savings between 2% and 23%.[34] Other Medicare demonstration projects have shown that bundled payment arrangements result in savings not only to the payer but also to the providers and consumers.[35]

Accountable Care Organizations. ACOs are a relatively recent innovation and little empirical evidence exists today that broadly substantiates their value in terms of cost reduction and quality improvement. However, several pilot programs suggest positive returns to the ACO model. CMS has estimated that Medicare Shared Savings Program will save of half a billion dollars between 2012 and 2014.[36] A study of a pilot ACO program in Maine showed evidence of substantial cost reductions coupled with improved health outcomes measures. During the observation period, savings from $33.77 PMPM in 2009 to $73.91 PMPM in 2011 were achieved, while acute admission rates, total acute days, and emergency department visits fell.[37] Other private and public ACO pilot programs have realized savings ranging from 2–3% reductions in PMPM costs.[38]

Further evidence suggests that ACOs are associated with lower utilization rates. A study of Arizona's Mercy Care Plan for dual eligible patients showed that, after adjusting for health risks, Mercy Care patients experienced 43% fewer days in the hospital, 21% fewer readmissions, and 9% fewer emergency department visits than their peers in FFS programs.[39]

As VBR models increase in use it is critical that Utah quickly identify and encourage the most effective VBR options. By allowing several systems to mature simultaneously rather than mandating a particular type of VBR system, intervention 1.3.1 will accelerate VBR adoption across the State, particularly in the private sector where policy influence is less direct. The follow is a discussion of the levers this intervention will impact to effect this acceleration:

Lever 1: Providing Information. Fundamentally, establishing a test for VBR systems is about providing the necessary information for relevant parties to adopt VBR reforms. Hesitance by providers and plans to immediately adopt these reforms stem from the fact that no best practices on VBR system administration yet exist. Establishing three VBR pilot programs within the State will allow other health plans to observe the lessons learned and tailor new VBR efforts to the individual needs of the providers and consumers they serve. New information about system effectiveness will provide motivation for adoption of future VBR systems.

[32] Cutler and Ghosh 2012.
[33] Cromwell et al. 1998.
[34] Bertko and Effros 2010.
[35] The Health Industry Forum 2011.
[36] Centers for Medicare and Medicaid Services 2011.
[37] Claffey et al. 2012.
[38] Salmon 2012; Meyer 2012.
[39] Murugan 2012.

Lever 3: Exert Market Pressures. As VBR systems reveal their merits through pilot programs within the State, it is assumed that competing plans will feel pressure to implement similar systems. Cost savings to the system will be attractive to payers and consumers, and improved quality metrics will be attractive to consumers and providers. These revelations will encourage plans to shift away from FFS plans and toward VBR plans. As more covered lives are shifted into VBR settings and the patient pool expands, the risk to providers will decrease, placing downward on PMPM prices.

Intervention 1.3.2 – Value metrics: Convene a group to formulate a set of outcome metrics that can be used to determine value in health care (value = quality/cost), which can be measured by data collected from payers or providers.

A critical obstacle for engaging providers in VBR contracts stems from the fact that quality metrics are not standard across payers. While a provider may be compensated for increasing a particular metric by one payer, they may be simultaneously penalized for the same movement by another payer. In order to mitigate these concerns and encourage providers to engage in at-risk contracting, physicians must feel confident that their practices can be standardized in a way that benefits them across payers.

The issue with standardizing quality metrics is that scores of metrics are currently used to measure quality of care. Identifying the most effective measures and sharing those finding across payers will help to encourage standardization.

A vast literature on a wide variety of quality measures focuses on the gains to quality of care due to standardized measures. The National Quality Measures Clearinghouse (NQMC) of the Agency for Healthcare Research and Quality (AHRQ) has diagramed a framework for categorizing measures that could potentially be used as a guide for framing the conversation around quality measures in VBR contracting.[40] An in-depth review of the hundreds of potential quality measures is beyond the scope of this report. However, we include a brief investigation of a single measure type, patient satisfaction, as an example of the complexity involved in examining the merits of quality measures.

Patient Satisfaction. There are several theoretical arguments for why improving patient satisfaction is beneficial to both providers and consumers. Decreased medical malpractice,[41] reduced employee turnover,[42] and patient/client loyalty[43] have all been associated with higher patient satisfaction ratings. These findings have led to a number of private and public payers incorporating patient satisfaction into their payment contracts with providers.[44]

Little research exists that directly connects patient satisfaction with lower expenditures. An internal preliminary analysis of the 2011 MEPS dataset suggests the relationship may not exist

[40] National Quality Measures Clearinghouse 2013.
[41] Levinson et al. 1997; Hickson et al. 1994; and Fullam et al. 2009.
[42] Rave et al. 2003.
[43] Safran et al. 2001.
[44] Aligning Forces for Quality 2010.

at all. The MEPS dataset contains a general measure of patient satisfaction taken from the AHRQ's CAHPS (Consumer Assessment of Healthcare Providers and Systems) project. On a scale of 1 to 10, the median score given by MEPS respondents was 8 or 9, with most people answering between 7 and 10. Regression analysis of the data suggests that patient satisfaction does not have a consistent association with expenditures. For Medicare and Medicaid, the MEPS model showed no significant relationship between patient satisfaction and spending. For the private market, the MEPS data suggest that increasing a patient satisfaction measure by 1 point on the CAHPS scale actually increases spending about $450 a year (between $204 and $695). Details may be found in the Appendix.

The MEPS analysis, however, is slightly dated and exists primarily in a non-VBR setting. There is some hope that when patient satisfaction is directly connected to reimbursement rates, physicians and providers will adjust practices in cost saving ways as suggested by previous literature. The materialization of these savings is likely to occur at a macro level rather than at a per patient or per episode level.

By convening a group of relevant stakeholders and charging the group with identifying key metrics that measure value, intervention 1.3.2 can overcome the obstacles that may result from having varied metrics used across VBR payers. The intervention will facilitate coordination between providers and multiple payers and encourage voluntary standards for quality metrics. The following is a discussion of the levers this intervention will impact to effect this acceleration:

Lever 2: Facilitate Coordination. The group of stakeholders charged with identifying value metrics that work will bring together groups with desperate interests in a manner that facilitates coalescence. The parties mutually benefit from standardized quality metrics, but they need motivation to begin the process of coming together on these terms. This intervention provides the needed forum for these discussions to take place.

Lever 4: Establish Voluntary Standards. The goal of the intervention is to provide convincing arguments in favor of certain quality metrics serving as standard measures. It is assumed that as participating stakeholders adopt these standards, it will become more likely that other stakeholders will adopt them as well. The widespread adoption of standardized measures will incentivize meaningful change in providers' behavior. Providers will have a clear pathway through which they can maximize their payment and reimbursement rates. Clinical practice and administration will adopt quality driven measures in order to maximize gains, placing upward pressure on overall care quality.

Intervention 1.3.2 is designed to expound on this type of analysis, substantiate the value of different quality metrics, and reduce the current use of hundreds of measures into a meaningful set of metrics that best reflect quality of care. Through new information, voluntary standardization, and the adoption of meaningful quality metrics, Utah stands to better align value and compensation in the health care

market. While the particular financial gains to such an emphasis are not yet known, there is reason to qualitatively believe that such gains to the system as a whole are possible.

Intervention 1.3.3 – Accelerate VBR efforts through the use of the All Payer Claims Database (APCD)
APCDs are a relatively new innovation and vary in composition across states. Ultimately, APCDs are a means to provide the necessary information to implement policies and innovations that improve the status of health care in Utah. Concrete, quantitative analyses of the benefits of current APCDs are limited. However, current qualitative research and comparative analyses of APCDs across the nation suggest that a fully operational and properly designed APCD could incentivize higher VBR adoption rates by pulling on several of the levers for change. These include:

> **Lever 1: Providing Information.** The primary role of the APCD is to provide a comprehensive source for studying the State's entire health care system. The resultant data source can be used for various system improvement initiatives by government, payers, providers, employers, and consumers.
>
> Utah is already using its APCD to better understand the status of its public health system.[45] AHRQ analyzed APCD data to determine the scope and costs associated with adverse drug events in Maine and New Hampshire.[46] Cost and risk information is essential for establishing payment rates for VBR plans and an APCD may be the best and most reliable source for the necessary information.[47]
>
> **Lever 2: Facilitating Coordination.** New Hampshire has shown that APCDs can provide a valuable medium for evaluating value-based payment and reimbursement reform efforts. For example, New Hampshire piloted five commercial ACOs,[48] and used claims data from the APCD to inform important decisions about them(e.g., whether they could calculate different global reimbursement options for various populations). The APCD also serves as an important source for cost and quality baselines and allows for patients to be tracked across payers and providers, improving coordination of care.
>
> **Lever 3: Exerting Market Pressure.** One of the most vaunted potential benefits of an APCD is the increased transparency it could bring to the health care market. Transparency has the potential to improve health care through lowering prices and improving quality. The basic principles of competition suggest that when consumers of health care can compare prices, the prices will gravitate towards the marginal cost of the service. Studies have shown that despite the relative inelastic demand for health care services by consumers, transparency does effectively place downward pressure on prices. These effects are realized by both consumers and providers.

[45] Utah Department of Health 2012.
[46] Miller and Culver 2009.
[47] Miller 2012.
[48] Staples and Porter 2010.

Consumer Effects. Scholars at the University of Chicago investigated the effect of price transparency regulations on health care expenditures across the nation. The research used micro data on health care purchases and found that "price transparency regulations reduce the price charged for common, uncomplicated, elective procedures by an average of approximately 7%."[49]

The study also suggested that transparency,[50] such as a searchable database on a publicly available website, is most effective means to lowering costs in areas where competition is high.

These findings are encouraging and suggest that investment in functioning APCDs can result in a significant ROI. It is important to note, however, that these returns seem to stem from a one-time monotonic shift of the health care cost curve. It is also plausible that within a specific state, the effect of transparency on prices may be small or even zero. The New Hampshire Insurance Department utilized claims data from 2005 to 2008 and found no decrease in the growth rate of prices during the study's time or after the implementation of their publicly available price transparency website.[51]

Provider Effects. There is also evidence that APCD driven public information will motivate providers and payers to equilibrate their pricing structures, placing further downward pressure on prices. Another New Hampshire study resulted in the introduction of benchmarking prices for the Medicaid program.[52] Benchmarks allow payers and providers to compete in terms of cost and quality, resulting in improvements on both dimensions.

Lever 4: Establishing Voluntary Standards. As a fully operational APCD is developed, and more information about the overall health care market becomes available, it is reasonable to conclude that payers, providers, and consumers will naturally converge on certain industry best practices. The current system suffers from a lack of complete information, making such voluntary standardizations difficult or impossible to achieve. The standardization of health care quality measures and outcome metrics, as described in intervention 1.3.2, rely on a functioning health information network that would be provided by the APCD. Similarly, as consumers become more aware of pricing information, price disparity across providers is likely to decrease.

[49] Christensen et al. 2013.
[50] "There are three broad categories of transparency laws: (i) requirements for hospitals to disclose estimated (or average) prices upon request from patients; (ii) requirements to report average price indicators to state health departments who then summarize and publish these figures in annual reports; (iii) requirements to report charge prices to agencies that establish searchable databases and make them available on public websites." (Christensen et al. 2013)
[51] New Hampshire Insurance Department 2009.
[52] New Hampshire Department of Health and Human Services, Office of Medicaid Business and Policy 2008.

Lever 5: Enacting and Enforcing Regulation. Legislation requiring participation in the APCD is already in place, and no further legislative rule changes have been envisioned by the stakeholders to facilitate achievement of the Subaim. However, some rule-making authority may still be exercised by the State as it moves forward with APCD improvements and information collection. As improvements in data quality begin to materialize, improved research abilities should provide policy makers a valuable resource for informing future regulatory change.

Continued maintenance and expansion of Utah's APCD should provide potential participants with the data they need to be successful in a VBR system. It allows providers to compare their costs and quality with similar providers across the State, providing insight on how to improve their system and get the best possible rate in a VBR system. It also provides payers and providers with the data they need to build VBR models with appropriate payment rates (it is important to note, however, that current data in the APCD, especially on smaller payers and providers, is too incomplete at this time to provide payers and providers with accurate information).

While the positive impact of the APCD on reaching the broad goal of moving to a VBR system is significant, the direct impact on cost savings is likely to be small. Working mostly through the market pressure lever, we would expect to see very small positive savings. However, large indirect savings are possible from the programs that are implemented based on findings achieved using APCD data.

Intervention 1.3.4 – Provide technical support to individuals, small business and public health to ensure ability to utilize VBR data and to ensure that new care coordination, case management and care transitions codes are fully utilized.

Individual practitioners and small practices may be less likely to readily transition to VBR plans because of costly structural changes.[53] These practices may not have the structure in place to accept new types of payments, gather or analyze quality data, track patients across providers, or integrate new Medicaid and Medicare codes.[54]

Additionally, individuals and small businesses shopping for health plans may not even be aware of VBR plans or the benefits they provide. In order to encourage higher VBR adoption rates these barriers must be overcome. Providing technical support to these groups in a variety of forms will impact the following levers for change:

Lever 1: Provide Information and Training. Providing information about VBR plans, their benefits, and how to get involved in a VBR system overcomes a significant barrier for individuals and small businesses shopping for health plans. Technical support for these groups could include an informative website or ad campaign that directs them to the relevant information about VBR plans.

[53] Brennen et al. 2009.
[54] Miller 2009.

In addition to information, health care providers may need specific training on VBR issues. A recent survey of physicians showed that physicians are dissatisfied with the time they spend interacting with health plans.[55] It also showed that they spend the smallest proportion of their time interacting with health plans on quality data. As quality measures are a key element to VBR contracting arrangements, it can be assumed that providers will be required to spend even more time and resources interacting with health plans. The apparent resentment toward an increase in administrative duties may be overcome by effectively educating providers on the benefits of VBR contracting, the procedural and operational implications of VBR, and the scope and variety of VBR arrangements that exist in the current market. It may also help them find a VBR model that could work best for their practice.[56] We expect that effectively training providers will reduce the reluctance some providers may feel about adopting the new payment models, thereby accelerating the adoption of VBR across the State.

Providers may also need additional administrative training, including training on measuring and analyzing data on standardized quality metrics. Additionally, it is critical that providers transitioning to a VBR contracting arrangement understand changes in their financial risk.[57] Lastly, providers should be trained on implementing new medical coding protocols and be introduced to technology solutions that could benefit their transition.[58]

Lever 2: Facilitate Coordination. In a VBR setting, providers often express concerns that quality metrics used to judge payment and reimbursement rates vary across health plans. Excelling in a particular metric may be rewarded by one plan, while being ignored or even penalized by another plan. Coordination between plans and between providers and plans is a critical element in successfully designing a multi-payer VBR system.

Training on quality metrics and care transition codes would encourage more consistency across plans and providers while also accelerating and facilitating the implementation of VBR systems.[59] To the extent that technical support will include helping providers obtain health information technology (health IT) systems, or train them on the use of these systems, makes the sharing of information across providers much easier and relieves some of the problems associated with non-standardized quality metrics.

Overall, the effectiveness of this intervention will depend greatly on the type of technical support provided and to which groups. Technical support aimed at targeting individuals and small businesses purchasing health plans is likely to have a smaller effect than those targeting providers. Purchasers of health plans are limited by the types of plans available while providers have more influence on what types of plans will become available. If there are fewer providers willing to accept VBR plans,

[55] Casalino et al. 2009.
[56] Tolle et al. 2011.
[57] Evans 2012.
[58] Bendix 2013.
[59] O'Reilly et al. 2011.

consumers will be less likely to purchase those plans and therefore payers will be less likely to offer them.

Choosing which providers will receive technical support is also an important factor. Voluntary participation in technical support programs tend to provide help to participants who are most likely to transition to VBR. Voluntary participation also means the programs are less likely to encourage the most resistant participants. As such, this intervention provides the most benefit to groups already moving to VBR that need additional help, rather than facilitating large scale movements. .To target potential participants who may wish to participate, but are facing informational or financial barriers, programs could limit participants to those who meet a set of qualifications such as practice size or demonstrated need.

Analysis of Subaim 2.1

Nationally, 5% of Medicare beneficiaries die each year. Spending on this 5% during the last year of life accounts for between 25% and 30% of all Medicare spending.[60] This results in per capita spending on Medicare decedents that is six times greater than spending on non-decedents.[61]

Considering the proportion of total spending on end-of-life care, the potential for savings in this spending category could be substantial. A small decrease in the cost of end-of-life care could be associated with a very large return in terms of real dollars.

It is important to note, however, that in Utah, these savings could be tempered by the fact that Utah is a very young state. Total Medicare spending in Utah in 2009 was 14% of total health care expenditures. The low figure is driven primarily by the young population. If the national figures hold, total end-of-life care from Medicare beneficiaries in Utah could represent between 2% and 5% of the total health care system, providing for much more modest gains than other states may realize. But, even with these very small numbers, the gains for decreasing spending on end-of-life care should yield a positive return.

Many advocates argue that end-of-life directives are a quality of care effort rather than a cost reduction initiative. Therefore, it is important to consider the effects that end-of-life interventions have on quality as well as costs. Research indicates that patients' preferences for end-of-life care are rarely ascertained correctly or observed accordingly.[62] In this section we discuss some of the implications of increasing the adoption of appropriate end-of-life documentation. We also discuss the impact of interventions 2.1.1 and 2.1.2 on accelerating the adoption rates and effectiveness of end-of-life documentation as well as the levers through which these interventions operate.

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[60] Riley and Lubitz 2010; Hoover et al. 2002; Hogan et al. 2001; Lubitz and Riley 1993.
[61] Barnato et al. 2004.
[62] Teno et al. 1997; Teno et al. 1994.

Summary of Intervention Effectiveness

In the following subsections we discuss the effectiveness of Advance Directives and POLST forms as well as each of the 2 interventions related to Subaim 2.1. We evaluate the merits of each of the interventions as the percentage of individuals in the State who have filed the relevant end-of-life related forms increases. The following matrix summarizes the levers that each intervention is expected to access.

Figure 6.2: POLST and Advance Directive Intervention Effectiveness Matrix

	INT 2.1.1 Health IT	INT 2.1.2 Crucial Conversations
Provide Information and Training	X	X
Facilitate Coordination	X	
Exert Market Pressure		X
Establish Voluntary Standards		
Enact and Enforce Regulation		

Obstacles to the Effectiveness of Advance Directives

- Inconsistent Wishes. The theoretical underpinnings of Advance Directive forms rely on the assumption that individuals have the information necessary to make decisions about their end-of-life care well in advance of the moment of decision. Scholars argue, however, that people cannot accurately predict in advance what medical decisions they may want in the future.[63] For example, individuals may misestimate the debilities they will face later in life,[64] misestimate their own ability to adapt to debilities,[65] or misestimate the likelihood of success of various interventions.[66] Each of these misestimations may lead to incongruence between the explicit wishes expressed in an Advance Directive and the actual patient's wishes at the moment of decision. Additionally, patients may change their desires given a new set of life or health circumstances.[67]

[63] Forow 1994.
[64] Loewenstein and Schkade 1999; Loewenstein 2005; Fried et al. 2006; Ubel 2006.
[65] Schkade and Kahneman 1998; Loewenstein and Schkade 1999.; Gilbert and Wilson 2000; Coppola et al 2001; Ubel 2006.
[66] Mitchell et al. 2009; Volandes et al. 2007.
[67] Tulsky 2005; Fagerlin et al. 2002; Ditto et al. 2006; Fried, Byers et al. 2006.

- Accurate Interpretation. From a practical standpoint, if Advance Directives are to be fully implemented, consumers and providers must be able to accurately interpret the information outlined in the Advance Directive itself.[68]

  Most Advance Directive forms are written at a 12th grade reading level or higher,[69] while the standard for medical materials is recommended to be at a 6th grade reading level.[70] In many areas of the country, language barriers also contribute to problems with interpretation.[71] If patients are unable to clearly understand the content of the forms or the implications of the treatments recommended on the forms, they cannot ensure that the forms reflect their actual wishes.

- Logistics. Traditionally, Advance Directive forms have been recorded in paper form, limiting scope and accessibility. Paper directives may not have enough physical space or conceptual depth for individuals to adequately express their wishes.[72] Missing documentation or inaccessibility to relevant providers and decision makers at the moment of care nullify the effort to keep Advance Directive documentation.[73]

- Surrogates**.** Advance Directives are often completed by surrogates rather than the actual patient. Surrogates' recall of a patient's preferences may be inaccurate.[74] Moreover, conflicts of interest between surrogates and patients or surrogates' own preferences for treatment may bias the end-of-life care a patient receives.[75]

- Effectiveness. Scholars have also pointed out that Advance Directives may not be as effective as often believed. An important critique is that Advance Directives do not have any discernible effect on the care received by patients at the end of life or that the care patients receive is inconsistent with their directive.[76]

- Physician Reluctance. Encouraging patients to file Advance Directive forms requires crucial conversations about end-of-life care between providers and patients. Some evidence suggests, however, that physicians may be reluctant to facilitate end-of-life conversations with patients out of concern for the patients' emotional well-being[77] or because of a lack of time, training, and/or skill in having end-of-life conversations.[78]

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[68] Schneiderman 1992; Ditto et al. 2001; Fagerlin et al. 2002; Upadya et al. 2002; Ditto et al. 2006; Berger 2010.
[69] Ache and Wallace, 2009; Mueller et al. 2010.
[70] Institute of Medicine, 2004.
[71] Smith et al. 2009.
[72] Levi and Green 2010; Teno et al. 1997; Holley et al. 1999.
[73] Tulsky 2005; Lynn and Goldstein 2003; Fagerlin and Schneider 2004.
[74] Shalowitz et al. 2006.
[75] Pruchno et al. 2005; Pruchno et al. 2006; Wrigley 2007.
[76] Schneiderman 1992; Teno, Licks, et al. 1997; Teno, Lynn 1997; Teno et al. 1994; Teno et al. 1993; Goodman, Tarnoff, and Slotman 1998.
[77] Kahana et al. 2004.
[78] Cherlin 2005; Tulsky 1998.

Obstacles to the Effectiveness of Physician's Orders for Life Sustaining Treatment (POLST) Forms

Much less research has been conducted on the obstacles preventing the effective use of a POLST form. However, the most common problems reported in a study[79] of a sample of 240 California hospitals that had adopted POLST include:

- Incomplete forms (missing signatures, incorrectly completed, or missing information)
- Patient wishes not honored as expressed (physicians not honoring POLST, family allowed to override patient's wishes)
- POLST transitions (individuals not arriving with form, not leaving with form, or lost forms)

The literature on Advance Directives suggests that many of the same obstacles relating to interpretation, logistics, surrogates, and physician reluctance are also relevant to POLST forms. Other frequently mentioned problems included lack of staff and physician training and incompatibility with electronic medical records necessary to obtain, maintain, and readily access POLST forms.

Advance Directives and Cost Reduction

While several studies have suggested that there is no relationship between Advance Directives and expenditures,[80] a 2011 study found that regions with lower levels of spending were more likely to have Advance Directives. As a result, "When patients in high-spending areas had Advance Directives limiting treatments, they averaged significantly lower end-of-life Medicare spending, were less likely to have an in-hospital death, and had significantly greater odds of hospice use than decedents without Advance Directives in these regions."[81]

In regions with medium and higher-than-average spending—where the norm is more aggressive treatment—patient preferences for less aggressive treatment have to be specified and documented. In terms of Medicare cost savings, these regions stand to gain the most from implementing Advance Directives.

In relatively low spending regions of the country, the authors estimated that those with a treatment limiting directive spent $559 more during the last six months of life ($21,966 for Advance Directive; $21,407 for no Advance Directive).

The 2011 study justifies the findings of several recent studies that have found significant decreases in expenditures associated with the use of Advance Directives.[82] However, the implications for Utah are

[79] Sugiyama, et al. 2011.
[80] Schneiderman 1992; Teno, Licks, et al. 1997; Teno, Lynn 1997; Teno et al. 1994; Teno et al. 1993; Goodman, Tarnoff, and Slotman 1998.
[81] Nicholas et al. 2011.
[82] Mitchell et al. 2009; Wright et al 2008; Zhang et al. 2009; Silviera 2010

inconclusive at this time. As Utah is composed of some of the lowest spending regions in the country,[83] the financial gains to Advance Directives are likely to be insignificant.

Physician's Orders for Life Sustaining Treatment and Cost Reduction

The effects of POLST forms on expenditures are not well documented. Advocates of POLST initiatives argue that POLST measures are designed to improve quality of care and reduce medical errors rather than reduce costs. There is some evidence that suggests quality of care is increased due to POLST forms.

The association between cost reduction and POLST programs must be inferred from the existing literature on utilization. Scholars have suggested that POLST forms have a negative impact on the intensity of end-of-life treatment.[84] If treatment intensity declines we can assume that some positive saving could be realized through POLST initiatives.

Intervention 2.1.1 – Develop and enhance Health IT enabled tools and assess their impact to support increasing the number of Utahans that have completed the appropriate end-of-life forms

Recent research has focused on the potential for health IT to simplify and improve planning[85] for end-of-life care. Many of the obstacles to Advance Directive and POLST forms outlined above may be mitigated by enhancements to health IT infrastructure.

However, the long-term capability of health IT to foster and improve the adoption and use of Advance Directives and POLST is still relatively untested.[86] One study about health IT and Advance Directives in Texas and Nevada concluded that crucial conversations between the patient and physician are an important factor.[87] Studies have shown that when people are aware of Advance Directives, they are more willing to use them.[88] Thus, online presence and infrastructure may help to increase adoption in Utah. When asked why they used a particular website to fill out an Advance Directive, the number one response for a survey of people in Texas and Nevada was "ease of use."[89]

Developing and enhancing health IT to support increasing the number of Utahns that have completed the appropriate end-of-life forms encourages system change through the following levers:

> **Lever 1: Providing Information.** The use of the Internet and health IT may help overcome many of the obstacles associated with establishing Advance Directives and POLST by providing a greater depth and breadth of information to patients and caregivers.

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[83] The Dartmouth Atlas of Healthcare 2013.
[84] Tolle et al. 1998; Hickman et al. 2004; Lee et al. 2000; Hickman et al. 2010
[85] Klugman and Usatine 2013; Bricker et al. 2003; El-Jawahri et al. 2010; Levi and Green 2010; Green and Levi 2011; Sherman 1998, Mistler and Drake 2008; Green and Levi 2012.
[86] Levi and Green 2010.
[87] Klugman and Usatine 2013.
[88] Alano et al., 2010; André s-Pretel et al. 2012; Á ngel-Ló pez-Rey et al., 2008; Antolí n et al., 2011.
[89] Klugman and Usatine 2013.

For example, the computer-based decision aid, *Making Your Wishes Known: Planning Your Medical Future*, uses audio, text, graphics, patient vignettes, and video of medical experts to help patients better understand and more deeply think about certain maladies and treatment options at the end of life.[90]

Furthermore, because checks, redundancies and algorithms can be built-in to computer-based advanced planning to better help to ensure consistency and clarity, health IT should help overcome the obstacle of interpretation among patients and caregivers.[91]

Computer-based programs can also help overcome the obstacles associated with using surrogates by making patients' wishes more clearly known and providing responses directly to care providers. Particularly, individuals may dictate under what conditions they want their surrogate to make decisions and who should take precedence in the event that the surrogate and the directive come into conflict.[92]

Health IT may also help doctors overcome misgivings about having end-of-life conversations with patients by increasing skills and confidence. A randomized controlled trial showed that computer-aided advanced planning among a group of medical students increased their knowledge, confidence, patient understanding, and satisfaction.[93]

Lever 2: Facilitating Coordination. Coordination between primary care providers, who would likely facilitate the crucial conversations and initiate the filing of the appropriate forms, and other providers, who may attend to the patient at long-term care facilities, emergency departments, hospitals, and other venues, is critical for the effectiveness of these initiatives. As decisions regarding life sustaining treatment often must be made instinctively by medical providers at the point of care, it is critical that Advance Directive and POLST forms are readily accessible to any provider who must make treatment decisions.

Health IT can facilitate transfer and coordination of end-of-life documents among health providers by making the forms storable and accessible to health care providers across the State.[94] This should in turn increase utilization of the forms and adoption rates.

Intervention 2.1.2 – Teach providers how to have crucial conversations around end of life, POLST, Advance Directives

Research has found that long-standing doctor-patient relationships are associated with the adoption of Advance Directives.[95] According to Puente et al., having a long-term relationship with a family doctor is associated with a 250% increase in the odds of using Advance Directives.[96]

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[90] Levi and Green 2010.
[91] Levi and Green 2010.
[92] Levi and Green 2010.
[93] Green and Levi 2011.
[94] Green and Levi 2009.

Additionally, crucial conversations are associated with significantly lower rates of ventilation. "Patients who reported having these discussions were less likely to receive mechanical ventilation (1.6% v. 11.0%; *P*=.02), undergo resuscitation (0.8% v. 6.7%; *P*=.02), or be admitted to the intensive care unit (4.1% v. 12.4%; *P*=.02). They were also more likely to be enrolled in outpatient hospice for more than a week 65.6% v. 44.5%, *P*=.03)."[97] Each of these factors intuitively leads to decreased end-of-life expenditures and increased congruence between treatment and desires of the patient. One study found a 37% decrease in expenditures during the last week of life that was associated with end-of-life crucial conversations.[98]

As cited earlier, physician training on crucial conversations significantly improves doctors' confidence and likelihood of engaging patients in conversations.[99] Training providers on how to have crucial conversations around end of life, POLST, and Advance Directives is expected to accelerate the rate of filing end-of-life forms through the following levers:

Lever 1: Provide training and information. Research shows that physicians with a small amount of training are more likely to successfully engage patients in end-of-life conversations.[100] As physicians are the agents through whom end-of-life forms are often completed, it is critical to gain their cooperation and participation. Providing training and information should remove barriers to engaging in crucial conversations and increase participation rates by providers; thereby increasing Advance Directive and POLST filing rates.

Lever 3: Exert market pressure. As physicians begin to engage in more conversations about end-of-life care, providers and consumers are likely to adjust their demands for end-of-life care related treatment. It is assumed that changes in demand will exert pressure on the market causing changes in price.

Providers will likely become more conscious of the end-of-life treatment options they prescribe. It is assumed that reorienting physician thinking toward a balance between treatment effectiveness and patient comfort will lead to adjustments in the scope and variety of health care services provided. As a result, we expect a decrease in demand for the most intensive and least effective treatments in the market. The decrease in demand will push suppliers to lower costs or decrease supply, thus exerting further pressures on the market.

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[95] Puente et al. 2014; Tulsky, 2005.
[96] Puente et al. 2014
[97] Wright et al. 2008, p1668.
[98] Zhang et al. 2009.
[99] Clayton et al. 2013; Szmuilowicz et al. 2010; Green and Levi 2011; Szmuilowicz et al. 2012; Schildmann et al. 2012; Levinson et al. 2010.
[100] Clayton et al. 2013; Szmuilowicz et al. 2010; Green and Levi 2011; Szmuilowicz et al. 2012; Schildmann et al. 2012; Levinson et al. 2010.

Consumers will also adjust their behavior as crucial conversations exert pressure on the decisions they make regarding their end-of-life care. It is assumed that training providers on crucial conversation will have a positive effect on their ability to inform patients about the likely effects of treatments. The new information should translate into reduced demand for end-of-life care. Scholars have already established this relationship exists. Crucial conversations about the end of life between patients and physicians are shown to help reduce aggressive medical care[101] and medical expenditures during the last week of life.[102]

While the overall positive effects that the two end-of-life interventions have on increasing the number individuals who have an appropriate end-of-life form on file are outlined above, the magnitude of the relationship between the interventions and the Subaim is more difficult to estimate. In large part, the interventions' effectiveness will depend on the scope of the IT tools used and the reach and depth of the training programs available to physicians around crucial conversations.

VII. Scope of Work and Limitations of the Analysis

The analysis is limited to evaluating the impact the Innovation Plan has on Utah's health care system and the costs to the State from implementing the Plan. However, innovations and interventions undertaken by the State will produce important consequences that are beyond the scope of this inquiry. These include, but are not limited to:

- Health Outcomes: A principal goal of the State Innovation Plan is the improvement of health outcomes in the Utah health care system. These improved health outcomes are partially reflected in reduced expenditures. However, not all improvements in health outcomes are associated with reduced expenditures. In theory, it is possible to monetize the effect of improved health outcomes using, for instance, quality-adjusted life years (QALYs), but the returns from improved health outcomes are not part of this ROI calculation.

- Industry Profits/Losses: The ROI method outlined in this report estimates the impact of State actions on total health care expenditures. These effects may have positive or negative effects on industry revenues and profits that could be significant (essentially, when health system reform eliminates "wasteful" expenditures, it also reduces someone's revenue). An estimation of any industry effects that are not reflected in expenditures is outside the scope of our ROI calculations.

- Private Intervention Costs: The imposition of new rules and the creation of new programs may impose financial gains or losses on third parties. Our ROI analysis only analyzes state health

[101] Wright et al. 2008.
[102] Zhang et al. 2009.

care system expenditures, and any other financial or non-financial effects are considered outside the scope of this analysis.

- Administrative and Political Costs: The implementation of health system reform also increases administrative and political costs for the State. Considering these costs are outside the scope of this ROI analysis.

In addition, due to the short time frame for completing the project, it was necessary to make several broad assumptions about both the data used in the financial analyses and the parameters used in the models. As such, the specific results of the analyses should only be considered within the context of the assumptions outlined in the report. Further, the primary goal of this report is to produce a methodology the State can use in future financial analyses conducted for its Health Care Innovation Plan, rather than exact point savings and ROI estimates. As the State moves forward with its Plan, and is able to refine assumptions and select more targeted data sources over time, the methodology outlined can be used to produce more precise results.

VIII. Technical Appendix

Methods and Data for Estimating the Baseline Model

Summary of Methods

Given the highly decentralized health care system in America, calculating the number of persons enrolling in different types of plans and the amount of money being spent in each type of plan requires utilizing data from a number of sources and making a variety of assumptions. Indeed, this is one reason why the State's pursuit of an all-payer claims database is so valuable: policymakers in the future will have a much greater capacity to identify how the health care dollar in the State is being spent and who is receiving the payments once the APCD is more complete and usable.

As noted earlier, the technical methods employed depend on the Enrollment Group (because the available data differs across groups). Given the importance of VBR to the State Innovation Plan, each payer is subdivided according to three categories:

1. FFS: Traditional FFS along with other plan types, such as PPOs that have no significant value-based compensation in place.
2. Managed care: This includes private HMOs, Medicare Advantage, Medicaid MCOs (and the new ACOs) as well as private ACOs and medical homes that do not meet the requirements for full VBR.

3. VBR: These include Medicare ACOs and other public/private ACOs where providers are compensated on a capitated basis for serving a defined population and compensation is based, at least in part, on meeting defined health care quality metrics.

Summary of Data

As noted previously, the construction of the baseline estimates for both enrollment and expenditures required synthesizing many different resources. When alternative sources with varying estimates were available, subjective judgment was employed to select the best estimates.

The following tables summarize the sources used for the various components of the baseline estimates.

Figure 8.1: Medicare Data Sources

Data Type and Plan Category	Source
Previous Enrollments:	
FFS	Table 508 Numbers from CMS-FFS KFF Dual-Eligible Adjustment
Managed Care	Medicare Advantage (Utah Insurance Market Reports) KFF Dual-Eligible Adjustment
VBR	Medicare ACO enrollment estimate KFF Dual-Eligible Adjustment
Previous Expenditures:	
FFS	NHE MEPS-BRFSS adjusted estimates for Utah MedPAC Dual –Eligible adjustment
Managed Care	NHE MEPS-BRFSS adjusted estimates for Utah MedPAC Dual –Eligible adjustment
VBR	JAMA VBR study savings factor
Future Enrollments:	
FFS	Fixed proportion of population based on most recent year
Managed Care	Fixed proportion of population based on most recent year
VBR	Fixed proportion of population based on most recent year
Future Expenditures:	
FFS	Previous Period MEPS-BRFSS adjusted estimates CBO Medicare expenditure forecasts
Managed Care	Previous Period MEPS-BRFSS adjusted estimates CBO Medicare expenditure forecasts
VBR	JAMA VBR study savings factor

Figure 8.2: Medicaid Data Sources

Data Type and Plan Category	Source
Previous Enrollments:	
FFS	National Health Expenditure Data (pre-2010) DOH Administrative Data (2010+) Annual Report Proportion KFF Dual-Eligible Adjustment
Managed Care	National Health Expenditure Data (pre-2010) DOH Administrative Data (2010+) Annual Report Proportion KFF Dual-Eligible Adjustment
VBR	None
Previous Expenditures:	
FFS	NHE MEPS-BRFSS adjusted estimates for Utah KFF Dual-Eligible Adjustment
Managed Care	NHE MEPS-BRFSS adjusted estimates for Utah KFF Dual-Eligible Adjustment
VBR	NHE MEPS-BRFSS adjusted estimates for Utah KFF Dual-Eligible Adjustment
Future Enrollments:	
FFS	Fixed proportion of population based on most recent year
Managed Care	Fixed proportion of population based on most recent year
VBR	Fixed proportion of population based on most recent year
Future Expenditures:	
FFS	Previous Period MEPS-BRFSS adjusted estimates CBO Medicaid expenditure forecasts
Managed Care	Previous Period MEPS-BRFSS adjusted estimates CBO Medicaid expenditure forecasts
VBR	Previous Period MEPS-BRFSS adjusted estimates CBO Medicaid expenditure forecasts

Figure 8.3: Dual-Eligibles Data Sources

Data Type and Plan Category	Source
Previous Enrollments:	
FFS	Table 508 Numbers from CMS-FFS KFF Dual-Eligible Adjustment
Managed Care	Medicare Advantage (Utah Insurance Market Reports) KFF Dual-Eligible Adjustment
VBR	Medicare ACO enrollment estimate KFF Dual-Eligible Adjustment
Previous Expenditures:	
FFS	NHE MEPS-BRFSS adjusted estimates for Utah MedPAC Dual-Eligible Adjustment
Managed Care	NHE MEPS-BRFSS adjusted estimates for Utah MedPAC Dual-Eligible Adjustment
VBR	JAMA VBR study savings factor
Future Enrollments:	
FFS	Fixed proportion of population based on most recent year
Managed Care	Fixed proportion of population based on most recent year
VBR	Fixed proportion of population based on most recent year
Future Expenditures:	
FFS	Previous Period MEPS-BRFSS adjusted estimates CBO Medicaid expenditure forecasts
Managed Care	Previous Period MEPS-BRFSS adjusted estimates CBO Medicaid expenditure forecasts
VBR	JAMA VBR study savings factor

Figure 8.4: CHIP Data Sources

Data Type and Plan Category	Source
Previous Enrollments:	
FFS	None
Managed Care	Utah Insurance Market Reports (pre-2012) Medicaid Annual Report (2012)
VBR	None
Previous Expenditures:	
FFS	None
Managed Care	NHE Forecasts based on 2010 data (pre-2010) Medicaid Annual Report (2010+)
VBR	NHE Forecasts based on 2010 data (pre-2010) Medicaid Annual Report (2010+)
Future Enrollments:	
FFS	Fixed proportion of population based on most recent year
Managed Care	Fixed proportion of population based on most recent year
VBR	Fixed proportion of population based on most recent year
Future Expenditures:	
FFS	None
Managed Care	CBO "Other Health Insurance Programs" expenditure forecasts
VBR	CBO "Other Health Insurance Programs" expenditure forecasts

Figure 8.5: Primary Care Network Data Sources

Data Type and Plan Category	Source
Previous Enrollments:	
FFS	Utah Insurance Market Reports
Managed Care	None
VBR	None
Previous Expenditures:	
FFS	NHE Utah Per Capita
Managed Care	None
VBR	None
Future Enrollments:	
FFS	Fixed proportion of population based on most recent year
Managed Care	None
VBR	None
Future Expenditures:	
FFS	Adjusted CBO Private insurance expenditure forecasts
Managed Care	None
VBR	None

Figure 8.6: HIPUtah Data Sources

Data Type and Plan Category	Source
Previous Enrollments:	
FFS	None
Managed Care	Utah Insurance Market Reports
VBR	None
Previous Expenditures:	
FFS	None
Managed Care	Utah Insurance HIPUtah Insurance Report
VBR	None
Future Enrollments:	
FFS	None
Managed Care	Fixed proportion of population based on most recent year
VBR	None
Future Expenditures:	
FFS	None
Managed Care	CBO "Other Health Insurance Programs" expenditure forecasts
VBR	None

Figure 8.7: Private Insurance Data Sources

Data Type and Plan Category	Source
Previous Enrollments:	
FFS	Categorized from Utah Insurance Market Report Data
Managed Care	Categorized from Utah Insurance Market Report Data
VBR	Categorized from Utah Insurance Market Report Data
Previous Expenditures:	
FFS	NHE Utah Per Capita MEPS-BRFSS adjusted estimates for Utah
Managed Care	NHE Utah Per Capita MEPS-BRFSS adjusted estimates for Utah
VBR	NHE Utah Per Capita MEPS-BRFSS adjusted estimates for Utah
Future Enrollments:	
FFS	Fixed proportion based on 5 year average of privately insured
Managed Care	Fixed proportion based on 5 year average of privately insured
VBR	Fixed proportion based on 5 year average of privately insured
Future Expenditures:	
FFS	Adjusted CBO Private insurance expenditure forecasts
Managed Care	Adjusted CBO Private insurance expenditure forecasts
VBR	None

Figure 8.8: Uninsured Data Sources

Data Type and Plan Category	Source
Previous Enrollments:	
FFS	Remainder of population based on linearly interpolated estimates (except 2010, 2012, and 2020, which use population estimates from the Census Bureau)
Managed Care	None
VBR	None
Previous Expenditures:	
FFS	NHE Utah Per Capita MEPS-BRFSS adjusted estimates for Utah
Managed Care	None
VBR	None
Future Enrollments:	
FFS	Remainder of population based on linearly interpolated estimates (except 2010, 2012, and 2020, which use population estimates from the Census Bureau)
Managed Care	None
VBR	None
Future Expenditures:	
FFS	Adjusted CBO Private insurance expenditure forecasts
Managed Care	Adjusted CBO Private insurance expenditure forecasts
VBR	None

End-of-Life Expenditure Subset

In order to model the effect of Advance Directives and POLSTs, a subset of the enrollment and expenditure model was created. This subset reflects the number and costs of expiring enrollees across enrollment groups each year for varying levels of AD/POLST penetration and incurred savings. The parameters used to determine the subset were derived from Year 2011 death tables from the State of Utah and national end-of-life expenditure statistics. Future deaths and expenditures rely heavily on the population parameters used in the original baseline model.

With the exception of expiring enrollees age 65 and older (who were all allocated to Medicare), deaths and expenditures were allocated proportionally across the remaining payer types in the model. The following table summarizes the sources used to create the end-of-life baseline subset.

Figure 8.9: End of Life Data Sources

Payer and Data Type	Source
Medicare:	
Enrollments	Utah Deaths 2011
Expenditures	Medicare End-of-Life Expenditure Proportion (27%), implying annual expenses for the percentage who dies to be 4.5 times the rate of those who do not die. Utah death rates by aged are applied to these rates to determine per-capita costs for the sub-population as a whole
Other Populations:	
Enrollments	Utah Deaths 2011
Expenditures	National End-of-Life Expenditure Proportion (10%), implying annual expenses for the percentage who die to be 10.5 times the rate of those who do not die. Utah death rates by aged are applied to these rates to determine per-capita costs for the sub-population as a whole.

Links to Data Sources

National Health Expenditures
http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsStateHealthAccountsResidence.html

Table 508 Numbers from CMS-FFS
http://innovation.cms.gov/Files/worksheets/StateInnovationModels_FinanceTemplate.xlsx

MedPAC Dual-Eligible Adjustments
http://www.medpac.gov/documents/Jun11DataBookEntireReport.pdf

http://www.medpac.gov/documents/Jun12DataBookEntireReport.pdf
http://www.medpac.gov/documents/Jun13DataBookEntireReport.pdf

Utah Health Insurance Market Reports
https://insurance.utah.gov/health/documents/2008HlthInsMrktRprt.pdf
https://insurance.utah.gov/health/documents/2009HlthInsMrktRprt4.pdf
https://insurance.utah.gov/health/documents/2010HlthInsMrktRpt-Correction.pdf
https://insurance.utah.gov/health/documents/2011HlthInsMrktRpt6-27-2013.pdf
https://insurance.utah.gov/health/documents/2012HlthInsMrktRprt.pdf

HIPUtah Insurance Reports
https://insurance.utah.gov/other/2007-annual-report/documents/TableK_Pool.pdf
https://insurance.utah.gov/other/2008-annual-report/documents/TableK-Pool.pdf
https://insurance.utah.gov/other/2009-annual-report/documents/TableK-Pool.pdf
https://insurance.utah.gov/other/2010-annual-report/documents/TableK-Health.pdf
https://insurance.utah.gov/other/2011-annual-report/documents/TableK.pdf
https://insurance.utah.gov/other/2012-annual-report/documents/TableK-Pool2012.pdf

Utah Medicaid/CHIP Annual Reports
http://www.health.utah.gov/medicaid/pdfs/annual_report2010.pdf
http://www.health.utah.gov/medicaid/pdfs/annual_report2011.pdf
http://www.health.utah.gov/medicaid/pdfs/annual_report2012.pdf

Kaiser Family Foundation (KFF) Dual-Eligible Adjustments
http://kff.org/medicaid/state-indicator/duals-as-a-of-medicare-beneficiaries/
http://kff.org/medicaid/state-indicator/duals-share-of-medicaid-spending/
http://kff.org/medicare/state-indicator/enrollees-as-a-of-total-medicare-population/

Utah Population Projections
http://governor.utah.gov/DEA/projections.html

Congressional Budget Office (CBO) Expenditure Forecasts
http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/Downloads/Proj2012.pdf

National End-of-life Expenditure Statistics
http://opinionator.blogs.nytimes.com/2013/01/03/better-if-not-cheaper-care/

JAMA VBR Savings Factor
Colla, Carrie H., et al. September 12, 2012. "Spending Differences Associated with the Medicare Physician Group Practice Demonstration." *JAMA*, Vol. 308(10): 1015-1023.

MEPS-BRFSS Estimates
http://meps.ahrq.gov/mepsweb/
http://health.utah.gov/opha/OPHA_BRFSS.htm

UDOH Administrative Data
Obtained from the Utah Department of Health

Description of MEPS Results

MEPS provides "nationally representative estimates of health care use, expenditures, sources of payment, and health insurance coverage for the U.S. civilian non-institutionalized population." MEPS offers details on health expenditures at the individual level not found in other surveys. Using MEPS data, it is possible to calculate average health care expenditures for consumers with various Payer and Plan types and predict the change in expenditures that will result from consumers moving between different Payer-Plan designations.

It is important to stress that these results are for the nation as a whole and are not specific to Utah. Utah differs from other states demographically in very important ways, the most important being that we are the youngest state in the nation. However, through the use of the MEPS microdata, it is possible to net out the effects of demographic and health variables and isolate the impact of health system variables, particularly the impact of type of insurance plan.

Description of Model

Using the 2011 wave of MEPS data, we estimated the percentage changes in expenditures that would result from an individual moving from non-managed care to managed care for the different payers (Medicare, Medicaid, and private), with and without adjustments for demographic and health characteristics. There are notable differences in demographics and health between the managed care and non-managed care groups for each payer. For example, compared to the Medicaid-HMO group, the Medicaid-non-HMO group has a higher proportion of whites (47% in the non-HMO group v. 38% in the HMO group), smokers (15% v. 10%), and obese persons (18% v. 15%). In addition, about twice as many Medicaid recipients are participating in HMO plans as non-HMO plans (the proportion of Utah Medicaid recipients in HMO plans is even higher).

We used multiple regression analysis to control or adjust for numerous demographic variables at the individual level using person-level weights. We adjusted for demographic characteristics (age, family income, gender, marital status, race), health factors (smoker, obese, pregnant), as well as self-reported health based on CMS findings that these are the most important variables impacting health spending at

the aggregate or state level. We also adjusted for education level (which we found to be significant at the individual level) as well as region (although region does not appear to impact expenditures).

By using *log(expenditures)* as the dependent variable we were able to *directly* estimate percentage changes in expenditures from moving from managed care/ HMO to non-managed care/ non-HMO. Predictions are based on observed (not latent) values from the MEPS dataset, but also take into account censoring, or the fact that many individuals have zero health expenditures. Without accounting for censoring, we would underestimate the effects of moving from one type of plan to the other. We used Tobit to control for individuals with zero health expenditures.

Estimated Changes

Using this model, our unadjusted or unconditional estimate for Medicare recipients moving from non-managed care to managed care is a 4.4% *increase* in personal health expenditures (see Figure 8.10). Controlling or adjusting for demographic, health, and self-reported health factors, we estimate that moving from Medicare non-managed care to Medicare managed care *increases* expenditures by 4.5%. Our unadjusted estimate for Medicaid recipients moving from non-HMO to HMO care is a 30.4% *decrease* in personal health expenditures. With adjustments for demographic, health, and self-reported health factors, we estimate that moving from Medicaid non-HMO care to Medicaid HMO care *increases* expenditures by 2.9%. For private insurance, our unadjusted estimate for moving from non-HMO to HMO care is a 26.9% *decrease* in personal health expenditures. Our adjusted or conditional estimate for moving from private non-HMO care to private HMO care is a 4.3% *decrease* in personal health expenditures.

Figure 8.10: Percent increase or decrease in health expenditures, unadjusted and adjusted, for an individual moving from non-managed (or non-HMO) care to managed (or HMO) care according to payer type.

	Change in expenditures moving from non-managed to managed care		**Change in expenditures moving from non-HMO to HMO care**	
Payer	Unadjusted	Adjusted	Unadjusted	Adjusted
Medicare	+4.4%	+4.5%		
Medicaid			-30.4%	+2.9%
Private			-26.9%	-4.3%

Further Analysis

For this analysis, we divided insurance plans into two main groups using the MEPS designations: HMO or non-HMO for private insurance and Medicaid, and managed care or non-managed care for Medicare. Within these two broad categories are numerous subcategories of plans. For example, the

HMO category includes private insurance plans that offer some reimbursement for "off-plan" services as well as private insurance plans that offer zero reimbursement for "off-plan" services. Private non-HMOs also represent a range of restrictiveness or cost-containment, such as gatekeeper plans that require a referral from a primary care physician to see a specialist or insurance plans with a book or list of preferred doctors with higher levels of reimbursement. We can use these subsets of insurance to create narrower categories of insurance type, but also to create different broad categories by combining the insurance types in different ways than they are aggregated by MEPS. We can also generate a range of cost savings by creating categories of insurance types that fall along a continuum from those that least to most resemble the gold standard of VBR arrangements.

Finally, we can break down projected expenditures into smaller categories, such as hospital expenses, physician expenses, and pharmaceutical expenses.

As mentioned above, MEPS offers details on health expenditures at the individual level not found in other surveys. However, the data set has several well-known limitations: MEPS underestimates spending generally (compared to the National Health Expenditure Account), and under-reports the number of persons on Medicaid. However, within insurance categories, we have found that MEPS data accurately reflect the ratios between different spending categories, so we surmise that our estimate of the cost-savings of moving from non-managed care to managed care using MEPs data is also accurate.

Simulation of Cost Reductions

The heart of the financial analysis depends on calculating the return from developing innovations in the State's health care system. These savings are the difference between the expenditures that would occur without any changes (the baseline projections) and expenditures that would occur due to accomplishing the Subaims (the Aim-adjusted projections). The projected cost savings are driven by a set of "key parameters" that affect both the baseline projections and the Aim-adjusted projections.

The Aim-adjusted projections start with the values for the baseline projections and are then adjusted according to the estimates of the effect of accomplishing the Subaim. These adjustments are derived from two primary sources: a review of the scholarly literature and internal estimates based on internal intelligence, information, and data. The goal from utilizing these two methods is to develop a reasonable range of parameter values to be used in the simulations.

There is a high degree of uncertainty involved from any estimation of future health care expenditures. Rather than trying to mask this uncertainty, it is better to build the uncertainty into the analysis. For each Subaim, a Monte Carlo simulation analysis is performed in which the key parameters in the model are allowed to vary within the reasonable range discussed above. This distribution allows the sensitivity of the results to vary within the underlying parameters. The mean of these projected values provide point estimates for the ROI, but the distribution of effects is the more meaningful outcome measure.

Finally, all future values are discounted and put in present-value, PMPY format. A 3% rate is used in all simulations. There is no one "right" answer on the appropriate discount rate to use for this analysis (differences among professional economists on this question are wide-ranging).

Cost Adjustment Parameters

In order to capture the uncertainty surrounding the relevant parameters, a lower bound, a mode (e.i., "most likely"), and an upper bound parameter are determined as discussed previously. In addition, many of these parameters utilize additional "smoothing" parameters. The smoothing parameters determine how strong a given effect is in a particular year. For example, a smoothing parameter of 1 in a given year indicates that the full force of the effect will occur in that year, while a smoothing parameter of 0.5 would indicate a half-effect. However, a smoothing value of 0 does not mean that there are no savings in that year; it means that there are no *incremental* savings from that adjustment parameter since the previous year. Most parameters are assumed to have no effect in the first year, followed by small increases, then a decline. The following tables contain the parameters used to model intervention effectiveness in the Monte Carlo simulations.

Enrollment Movement Parameters

Enrollment movement parameters determine how quickly an enrollment group transforms from FFS and MC into MC and VBR. In some cases, movement takes place in two places—enrollees are moving from FFS to MC or VBR and also from MC to VBR. In other cases, movement occurs strictly from FFS to VBR or MC to VBR. Enrollment groups with two growth patterns have parameters that indicate a proportion change for each plan type, while enrollment groups with a single growth patterns have a parameters that indicates a percentage point change. For example, Medicare enrollment moves from FFS to VBR and MC to VBR. If the realized parameter value for both movements is 8.0%, this means that 8.0% of the FFS enrollees and 8.0% of the MC enrollees move towards VBR each year. On the other hand, CHIP enrollment only moves from MC to VBR. If the realized value for this movement is 12.5%, this means that 12.5 *percentage points* are removed from the MC population and added to the VBR population.

Figure 8.11: Enrollment Group Movement Parameters

Possible Movement by Payer	% of Enrollees to VBR per Year		
	Low	**Mode**	**High**
Medicare			
FFS to VBR	0.0%	8.0%	50.0%
MC to VBR	0.0%	8.0%	25.0%
Medicaid	*Low*	*Mode*	*High*
FFS to MC	0.0%	5.0%	10.0%
MC to VBR	0.0%	17.0%	50.0%
Dual-Eligible	*Low*	*Mode*	*High*
Uses Medicare parameters			
CHIP	*Low*	*Mode*	*High*
MC to VBR	0.0%	12.5%	25.0%
PCN	*Low*	*Mode*	*High*
FFS to VBR	0.0%	12.5%	25.0%
HIPUtah	*Low*	*Mode*	*High*
MC to VBR	0.0%	12.5%	25.0%
Private	*Low*	*Mode*	*High*
FFS to MC	0.0%	10.0%	27.0%
MC to VBR	0.0%	8.0%	40.0%

VBR Environmental Factors

VBR environmental factors determine the increasing efficiency growth stemming from the overall VBR environment over time. This parameter captures the growth occurring from the coordination and communication efforts being undertaken as part of the state plan. As discussed earlier, this parameter uses smoothing parameters. In this case, the environmental factors ramp up during Year 2, peak in Year 3, and ramp down in Year 4, with no new effect in Year 5. The parameters indicate a multiplicative savings factor. The VBR environment factors have no effect on FFS operations.

Figure 8.12a: VBR Environmental Factors

	Low	Mode	High
MC	-0.25%	0.13%	0.50%
VBR	-0.25%	0.25%	0.75%

Figure 8.12b: Environmental Factor Smoothing Parameters

Year	Parameter
Year 1	0
Year 2	0.25
Year 3	0.5
Year 4	0.25
Year 5	0

Quality Metrics

Quality metrics parameters determine the effect of introducing quality metrics to the plans in each enrollment group. Several enrollment groups have null parameters, indicating that quality metrics are anticipated to have no effect or could not be effectively implemented. Given the anticipated delay between implementation and savings, the quality metrics effect is present only in Years 3, 4, and 5.

Figure 8.13: Quality Metric Parameters

	Low	Mode	High
Medicare	-3%	0	3%
Medicaid	-3%	0	3%
Dual-Eligible	-3%	0	3%
CHIP	--	--	--
PCN	--	--	--
HIPUtah	-3%	0	3%
Private	-3%	0	3%
Uninsured	--	--	--

APCD

APCD parameters determine the effect of a fully functioning APCD on the health care expenditures across enrollment groups. The smoothing parameters in this case indicate a large, sudden gain in Year 3 that ramps down during Years 4 and 5. Additional effects occur outside the analysis window (the smoothing parameter in Year 6 would be 0.1).

Figure 8.14a: APCD Parameters

Low	Mode	High
0.0%	2.5%	7.0%

Figure 8.14b: APCD Smoothing Parameters

Year	Parameter
Year 1	0
Year 2	0
Year 3	0.6
Year 4	0.2
Year 5	0.1

Advance Directive/POLST

The Advance Directive/POLST parameters have two components: population proportions and savings parameters. The population proportion indicates the percentage of the expiring population with an AD/POLST in a given year. The savings parameter indicates the expected savings from the presence of the AD/POLST for the expiring enrollees. Unlike other savings within the models, savings on end-of-life wishes do not propagate into the future. That is, reducing end-of-life expenditures in one year does not affect the baseline expenditures in the next year.

Figure 8.15: Advance Directive/POLST Parameters

Proportion of dying population with AD/POLST		
Low	Mode	High
20%	25%	30%

Saving Parameters		
Low	Mode	High
-8%	2%	10%

Distribution of Results

Distribution Tables

After performing 100,000 Monte Carlo simulations, NPVs, ROIs, and average annual savings (in percentage terms) are calculated according to the methodology outlined previously in the report. The tables below show the results of the simulation.

Figure 8.16: Subaim 1.3 (VBR), NPV

	3-year				5-year			
Population	*Mean*	*25th*	*50th*	*75th*	*Mean*	*25th*	*50th*	*75th*
Medicare	$288	$181	$287	$394	$1,072	$479	$1,076	$1,674
Medicaid	$256	$165	$256	$347	$952	$456	$960	$1,453
Dual-Eligible	$1,587	$1,141	$1,577	$2,025	$5,430	$3,396	$5,446	$7,494
CHIP	$48	$33	$46	$62	$183	$124	$176	$238
PCN	$132	$90	$127	$172	$520	$356	$500	$677
HIPUtah	$183	$90	$182	$276	$693	$195	$699	$1,200
Private	$363	$264	$361	$460	$1,232	$832	$1,241	$1,637
Uninsured	$38	$25	$36	$50	$149	$99	$143	$198
Total	$332	$255	$331	$408	$1,151	$838	$1,153	$1,469

Figure 8.17: Subaim 1.3 (VBR), ROI

	3-year				5-year			
Population	*Mean*	*25th*	*50th*	*75th*	*Mean*	*25th*	*50th*	*75th*
Medicare	207	130	206	283	770	344	773	1202
Medicaid	184	118	184	249	684	328	690	1044
Dual-Eligible	1140	820	1133	1455	3901	2440	3913	5384
CHIP	34	23	33	45	131	89	126	171
PCN	95	65	91	124	374	256	360	486
HIPUtah	131	65	131	198	498	140	502	862
Private	261	190	259	331	885	597	891	1176
Uninsured	27	18	26	36	107	71	103	142
Total	239	184	238	293	827	602	829	1055

Figure 8.18: Subaim 1.3 (VBR), Average Annual Savings

	3-year				5-year			
Population	*Mean*	*25th*	*50th*	*75th*	*Mean*	*25th*	*50th*	*75th*
Medicare	1%	1%	1%	1%	2%	1%	2%	3%
Medicaid	1%	1%	1%	1%	2%	1%	2%	3%
Dual-Eligible	2%	1%	2%	2%	3%	2%	3%	4%
CHIP	1%	0%	1%	1%	2%	1%	1%	2%
PCN	1%	0%	1%	1%	2%	1%	2%	2%
HIPUtah	1%	0%	1%	1%	2%	0%	2%	3%
Private	2%	1%	2%	2%	4%	3%	4%	5%
Uninsured	1%	0%	1%	1%	1%	1%	1%	2%
Total	2%	1%	2%	2%	3%	2%	3%	4%

Figure 8.19: Subaim 2.1 (POLST), NPV

	3-year				5-year			
Population	*Mean*	*25th*	*50th*	*75th*	*Mean*	*25th*	*50th*	*75th*
Medicare	$19	-$19	$22	$58	$34	-$33	$37	$101
Medicaid	$1	-$1	$1	$3	$2	-$2	$2	$6
Dual-Eligible	$3	-$3	$3	$9	$5	-$5	$6	$16
CHIP	$0	$0	$0	$0	$0	$0	$0	$1
PCN	$1	-$1	$2	$4	$2	-$2	$3	$7
HIPUtah	$2	-$2	$2	$6	$3	-$3	$4	$10
Private	$1	-$1	$1	$3	$2	-$2	$2	$6
Uninsured	$0	$0	$0	$1	$1	-$1	$1	$2
Total	$4	-$2	$4	$10	$7	-$3	$7	$17

Figure 8.20: Subaim 2.1 (POLST), ROI

	3-year				5-year			
Population	*Mean*	*25th*	*50th*	*75th*	*Mean*	*25th*	*50th*	*75th*
Medicare	20	-20	23	61	35	-35	39	106
Medicaid	1	-1	1	3	2	-2	2	6
Dual-Eligible	3	-3	4	10	6	-5	6	17
CHIP	0	0	0	0	0	0	0	1
PCN	2	-1	2	5	3	-3	3	8
HIPUtah	2	-2	2	6	4	-3	4	11
Private	1	-1	1	3	2	-2	2	6
Uninsured	0	0	0	1	1	-1	1	2
Total	4	-2	4	10	7	-3	8	18

Figure 8.21: Subaim 2.1 (POLST), Average Annual Savings

	3-year				5-year			
Population	*Mean*	*25th*	*50th*	*75th*	*Mean*	*25th*	*50th*	*75th*
Medicare	0.07%	-0.07%	0.07%	0.20%	0.07%	-0.07%	0.07%	0.20%
Medicaid	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.01%
Dual-Eligible	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.01%
CHIP	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.01%
PCN	0.01%	-0.01%	0.01%	0.02%	0.01%	-0.01%	0.01%	0.02%
HIPUtah	0.01%	-0.01%	0.01%	0.02%	0.01%	-0.01%	0.01%	0.02%
Private	0.01%	-0.01%	0.01%	0.02%	0.01%	-0.01%	0.01%	0.02%
Uninsured	0.01%	-0.01%	0.01%	0.02%	0.01%	-0.01%	0.01%	0.02%
Total	0.01%	-0.01%	0.01%	0.03%	0.01%	-0.01%	0.02%	0.03%

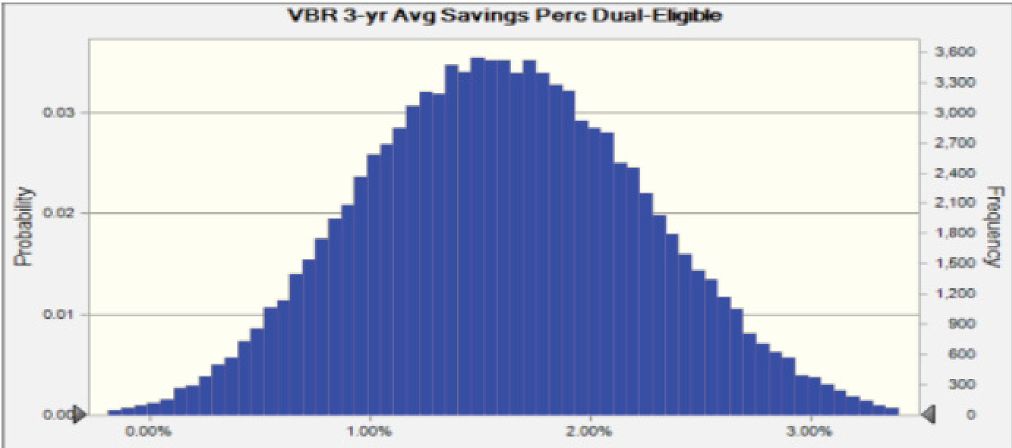
Distributional Diagrams and Additional Statistics

As discussed previously, the construction of these simulations yields a range of outcomes, rather than a single point estimate. The histogram in the Crystal Ball output in Figure 8.22 graphically demonstrates the ranges of possible outcomes detailed in the tables above. Additional statistical parameters are also included.

The full simulation report from Crystal Ball (152 pages) is available on request.

Figure 8.22: Crystal Ball Output, Subaim 1.3 (VBR), 3-Year Average Annual Savings for Dual-Eligibles

Summary:
Entire range is from -0.63% to 3.87%
Base case is 0.82%
After 100,000 trials, the std. error of the mean is 0.00%



Statistics:	Forecast values
Trials	100,000
Base Case	0.82%
Mean	1.60%
Median	1.59%
Mode	---
Standard Deviation	0.64%
Variance	0.00%
Skewness	0.0867
Kurtosis	2.74
Coeff. of Variation	0.3987
Minimum	-0.63%
Maximum	3.87%
Range Width	4.50%
Mean Std. Error	0.00%

IX. Bibliography

Ache, K.A., and Wallace, L.S. 2009. “Are end-of-life patient education materials readable?” *Journal of Palliative Medicine*, Vol. 23:545-548.

Alano, G.J., et al. 2010. “Factors influencing older adults to complete advance directives.” *Palliative & Supportive Care*, Vol. 8(3): 267–275.

Aligning Forces for Quality. 2010. *Good for Health, Good for Business: the Case for Measuring Patient Experience of Care*. The Center for Health Care Quality, George Washington University Medical Center.

Andrés-Pretel, F., et al. 2012. “Seniors’ knowledge of and attitudes to advance directive documents.” *Gaceta Sanitaria*, Vol. 26(6): 570–573, (in Spanish).

Ángel-López-Rey, E., et al. 2008. “Knowledge and attitudes of the population about the living wills.” *Enfermería Clínica*, Vol. 18(3): 115–119, (in Spanish).

Antolín, A., Sánchez, M., and Miró, O. 2011. “Temporal trend in understanding of and attitudes to advance directives in patients with chronic diseases.” *Gaceta Sanitaria*, Vol. 25(5): 412–418, (in Spanish).

Baicker, K., and Goldman, D. Spring 2011. “Patient Cost-Sharing and Healthcare Spending Growth.” *Journal of Economic Perspectives,* Vol. 25(2): 47–68.

Barnato, A.E., et al. 2004. “Trends in Inpatient Treatment Intensity among Medicare Beneficiaries at the End of Life,” *Health Services Research,* Vol. 39(2): 363-376.

Bendix, J. March 10, 2013. “Making sense of the new transitional care codes.” *Medical Economics*, Vol. 90(5):40, 42-44, 47.

Berger, J.T. 2010. “What about process? Limitations in advance directives, care planning, and noncapacitated decision making.” *American Journal of Bioethics*, Vol. 10(4): 33-34.

Bertko, J., and Effros, R. 2010. *Analysis of Bundled Payment*. RAND Health Comprehensive Assessment of Reform Efforts (COMPARE).

Brandeis University, The Heller School for Social Policy and Management. *Episode Payment: Private Innovation and Opportunities for Medicare.* The Health Industry Forum Conference Report, held on May 17, 2011 in Washington, D.C.

Brennen, N., et al. August 2009. *Improving Quality and Value in the U.S. Health Care System*. The Bipartisan Policy Center.

Bricker L.J., Lambing A., and Markey, C. 2003. “Enhancing communication or end-of-life care: an electronic advance directive process.” *Journal of Palliative Medicine,* Vol. 6(3): 511-519.

California HealthCare Foundation. February 2004. *Preventing Unnecessary Hospitalization in Medi-Cal: Comparing Fee-for-Service with Managed Care.* Prepared by Primary Care Research Center, University of California.

Casalino, L.P., et al. July/August 2009. “What Does it Cost Physician Practices to Interact with Health Insurance Plans?” *Health Affairs*, Vol. 28(4): 533-543.

Center for Health Care Strategies. January 2003. *Comparison of Medicaid Pharmacy Costs and Usage between the Fee-for-Service and Capitated Settings.* Prepared by the Lewin Group.

Centers for Medicare and Medicaid Services. April 7, 2011. *Medicare Program; Medicare Shared Savings Program: Accountable Care Organizations, Proposed Rule*. Federal Register 76, no.67.

Cherlin, E., et al. 2005. “Communication between physicians and family caregivers about care at the end of life: When do discussions occur and what is said?” *Journal of Palliative Medicine*, Vol. 8(6): 1176–1185.

Christensen, H.B., Floyd, E., and Maffet, M. October 2013. *The Effects of Price Transparency Regulation on Prices in Healthcare Industry*. University of Chicago, Booth School of Business and Center for Health and the Social Sciences.

Claffey, T.F., et al. 2012. “Payer-Provider Collaboration in Accountable Care Reduced Use and Improved Quality in Maine Medicare Advantage Plan.” *Health Affairs,* Vol. 31(9): 2074-2083.

Clayton, J.M., et al. 2013. “Evaluation of a novel individualised communication-skills training intervention to improve doctors' confidence and skills in end-of-life communication.” *Journal of Palliative Medicine*, Vol. 27(3): 236-243.

Coppola, K.M., et al. 2001. “Accuracy of primary care and hospital-based physicians’ predictions of elderly outpatients’ treatment preferences with and without advance directives.” *Archives of Internal Medicine,* Vol. 161(3): 431–440.

Cromwell, J., et al. September 1998. *Medicare Participating Heart Bypass Center Demonstration: Final Report.* Prepared by Health Economics Research, Inc. Funded by the Health Care Financing Administration.

Cutler, D.M., and Ghosh, K. March 22, 2012. “The Potential for Cost Savings through Bundled Episode Payments.” *The New England Journal of Medicine,* Vol. 366(12): 1075-1077.

Cutler, D.M. and Sheiner, L. August 1997. *Managed Care and the Growth of Medical Expenditures*. NBER Working Paper 6140.

Cutler, D.M., McClellan, M., and Newhouse, Joseph P. 2000. "How Does Managed Care Do It?" *The RAND Journal of Economics,* Vol. 31(3): 526-548.

Dentzer, S. 2012. "One Payer's Attempt to Spur Primary Care Doctors to Form New Medical Homes." *Health Affairs,* Vol. 31(2): 341-349.

Ditto P.H., et al. 2001. "Advance directives as acts of communication: a randomized controlled trial." *Archives of Internal Medicine,* Vol. 161(3): 421-430.

Ditto, P.H., et al. 2006. "Context changes choices: A prospective study of the effects of hospitalization on life-sustaining treatment preferences." *Medical Decision Making,* Vol. 26(4): 313–322.

Duggan, M., and Hayford, T. 2013. "Has the Shift to Managed Care Reduced Medicaid Expenditures? Evidence from State and Local-Level Mandates." *Journal of Policy Analysis and Management*, Vol. 32(3): 505-535.

El-Jawahri A., Podgurski L.M., and Eichler A.F. 2010. "Use of video to facilitate end-of-life discussions with patients with cancer: a randomized controlled trial." *Journal of Clinical Oncology*, Vol. 28(2): 305-310.

Evans, J. September 12, 2012. "Transitioning to Value-Based Reimbursement." *Executive Insight*. Advance Healthcare Network.

Fagerlin, A., et al. 2002. "The use of advance directives in end-of-life decision making." *American Behavioral Scientist,* Vol. 46(2): 268–283.

Fagerlin, A., and Schneider, C.E. 2004. "Enough: the Failure of the Living Will." *Hastings Center Report,* Vol. 34(2): 30–42.

Fischer, E.S., et al. 2003. "The Implications of Regional Variations in Medicare Spending. Part 1: The Content, Quality, and Accessibility of Care." *Annals of Internal Medicine,* Vol. 138: 273-287.

Fisher, E.S., et al. 2003. "The Implications of Regional Variations in Medicare Spending. Part 2: Health Outcomes and Satisfaction with Care." *Annals of Internal Medicine,* Vol. 138: 288-298.

Forow, L. 1994. "The green eggs and ham phenomenon." *Hastings Center Report*, Vol. 24(6): S29–S32.

Fried, T.R., Bradley, E.H., and O'Leary, J. 2006. "Changes in prognostic awareness among seriously ill older persons and their caregivers." *Journal of Palliative Medicine*, Vol. 9(1): 61–69.

Fried, T.R., et al. 2006. “Prospective study of health status preferences and changes in preferences over time in older adults.” *Archives of Internal Medicine*, Vol. 166(8): 890–895.

Fullam F., et al. May 2009. “The use of patient satisfaction surveys and alternate coding procedures to predict malpractice risk.” *Medical Care,* Vol. 47(5): 1-7.

Gilbert, D.T., and Wilson, T.D. 2000. “Miswanting: Some problems in the forecasting of future affective states.” In *Feeling and Thinking: the Role of Affect in Social Cognition*. Ed. J. P. Forgas. New York: Cambridge University Press, 178–197.

Goodman, M.D., Tarnoff, M., and Slotman, J.G. 1998. “Effect of advance directives on the management of elderly critically ill patients.” *Critical Care Medicine*, Vol. 26(4): 701–704.

Green, M.J., and Levi, B.H. 2009. “Development of an interactive computer program for advance care planning.” *Health Expectations*, Vol. 12(1): 60–69.

Green, M.J., and Levi, B.H. March 2011. “Teaching Advance Care Planning to Medical Students with a Computer-Based Decision Aid.” *Journal of Cancer Education,* Vol. 26(1): 82-91.

Green, M.J., and Levi, B. 2012. “The era of “e”: The use of new technologies in advance care planning.” *Nursing Outlook,* Vol 60: 376-383.

Hadley, J., and Holahan, J. Winter 2003/2004. “Is Health Care Spending Higher under Medicaid or Private Insurance?” *Inquiry,* Vol. 40(4): 323-342.

Hellinger, F.J. 1996. “The Impact of Financial Incentives on Physician Behavior in Managed Care Plans: A Review of the Evidence.” *Medical Care Research and Review*, Vol. 53(3): 294-314.

Hickman, S.E., et al. July 2010. “A Comparison of Methods to Communicate Treatment Preferences in Nursing Facilities: Traditional Practices Versus the Physician Orders for Life-Sustaining Treatment Program.” *Journal of the American Geriatrics Society*, Vol. 58(7): 1241-1248.

Hickson, G.B.C., et al. 1994. “Obstetricians’ prior malpractice experience and patients’ satisfaction with care.” *JAMA*, Vol. 272: 1583-1587.

Hickson, G.H., Altemeier, W.A., and Perrin, J.M. 1987. “Physician Reimbursement by Salary or Fee-for-Service: Effect on Physician Practice Behavior in a Randomized Prospective Study.” *Pediatrics*, Vol. 80: 344-350.

Hogan, C., et al. 2001. ‘‘Medicare Beneficiaries’ Costs of Care in the Last Year of Life.’’*Health Affairs*, Vol. 20(4): 188–95.

Holley, J.L., et al. 1999. “Failure of advance care planning to elicit patients’ preferences for withdrawal from dialysis.” *American Journal of Kidney Diseases*, Vol. 33(4): 688–693.

Hoover, D.R., et al. 2002. “Medical Expenditures in the Last Year of Life: Findings from the 1992–1996 Medicare Current Beneficiary Survey.” *Health Services Research*, Vol. 37(6): 1625–1642.

Institute for Health Metrics and Evaluation. *Life Expectancy US Counties 1989-2009.*

Institute of Medicine. 2004. *Health Literacy: A Prescription to End Confusion*. Washington, D.C.: National Academies Press.

Kahana, B., et al. 2004. “The personal and social context of planning for end-of-life care.” *Journal of American Geriatric Society*, Vol. 52(7): 1163–1167.

Kaiser Family Foundation. 2012. *Medicaid-to-Medicare Fee Index*.

Klein, S., and McCarthy, D. July 2010. *Genesee Health Plan: Improving Access to Care and the Health of Uninsured Residents through a County Health Plan.* The Commonwealth Fund.

Klugman, C.M., and Usatine, R.P. November 2013. “An Evaluation of 2 Online Advance Directive Programs.” *American Journal of Hospice and Palliative Medicine,* Vol. 30(7): 657-663.

Levi, B.H., and Green, M.J. 2010. “Too soon to give up: re-examining the value of advance directives.” *American Journal of Bioethics*, Vol 10(4):3-22.

Levinson W., et al. 1997. “Physician-patient communication: the relationship with malpractice claims among primary care physicians and surgeons.” *JAMA*, Vol. 277: 553-559.

Levinson, W., Lesser, C.S., and Epstein, R.M. 2010. “Developing Physician Communication Skills For Patient-Centered Care.” *Health Affairs*, Vol. 29(7): 1310-1318.

Loewenstein, G., and D. Schkade. 1999. “Wouldn’t it be nice? Predicting future feelings.” In *Well-being: The foundations of hedonic psychology*. Eds. D. Kahneman, E. Diener, and N. Schwarz. New York: Russell Sage, pgs. 85–105.

Loewenstein, G. 2005. “Projection bias in medical decision making.” *Medical Decision Making,* Vol. 25(1): 96–105.

Lubitz, J.D., and Riley, G.F. 1993. “Trends in Medicare Payments in the Last Year of Life.” *The New England Journal of Medicine*, Vol. 328(15): 1092-1096.

Lynn, J., and Goldstein, N.E. 2003. “Advance care planning for fatal chronic illness: avoiding commonplace errors and un warranted suffering.” *Annals of Internal Medicine*, Vol. 138(10): 812–818.

Maeng, D.D., et al. 2012. “Reducing Long-Term Cost by Transforming Primary Care: Evidence from Geisinger’s Medical Home Model.” *American Journal of Managed Care,* Vol. 18(3): 149-155.

Manning, W.G., et al. 1987. “Health Insurance and the Demand for Medical Care: Evidence from a Randomized Experiment.” *American Economic Review*, Vol. 77(3): 251-277.

Mas, N., and Seinfeld, J. March 6, 2008. “Is managed care restraining the adoption of technology by hospitals?” *Journal of Health Economics,* Vol. 27: 1026-1045.

Meyer, H. 2012. “Many Accountable Care Organizations Are Now Up and Running, If Not Off to the Races.” *Health Affairs,* Vol. 81(11): 2868-2867.

Miller, C., et al. 2011. “Large Variations in Medicare Payments for Surgery Highlight Savings Potential from Bundled Payment Programs.” *Health Affairs,* Vol. 30(11): 2107-2115.

Miller, H.D. September/October 2009. “From Volume to Value: Better Ways to Pay for Health Care.” *Health Affairs,* Vol. 28(5): 1418-1428.

Miller, H.D. December 2012. *Ten Barriers to Healthcare Payment Reform and How to Overcome Them*. Center for Healthcare Quality and Payment Reform.

Miller, P.B., and Culver, D.S. September 2009. *Issue Brief: Utilization and Costs for Adverse Drug Reactions in Maine and New Hampshire: 2005-2007*. University of New Hampshire, New Hampshire Institute for Health Policy and Practice.

Mistler, L.A., and Drake, R.E. 2008. “Shared Decision Making in Antipsychotic Management.” *Journal Of Psychiatric Practice*, Vol. 14(6): 333-344.

Mitchell, S.L., et al. October 2009. “The Clinical Course of Advanced Dementia,” *The New England Journal of Medicine*, Vol. 361(16): 1529-1538.

Mueller, L.A., Reid, K.I., and Mueller, P.S. 2010. “Readability of state-sponsored advance directive forms in the United States: a cross sectional study.” *BMC Medical Ethics*, Vol. 11:6.

Murugan, V., Drozd, E., and Dietz, K. July 2012. *Analysis of Care Coordination Outcomes: A Comparison of the Mercy Corps Plan Population to Nationwide Dual-Eligible Medicare Beneficiaries.* Avalere Health. Funded by Aetna Inc.

National Quality Measures Clearinghouse. 2013. “Domain Framework for Inclusion Criteria.” Agency for Healthcare Research and Quality.
<http://www.qualitymeasures.ahrq.gov/about/domain-framework.aspx>

Nelson, L. January 2012. *Lessons from Medicare’s Demonstration Projects on Value-Based Payment*. Congressional Budget Office. Working Paper 2012-02.

New Hampshire Department of Health and Human Services, Office of Medicaid Business and Policy. October 1, 2008. *New Hampshire Medicaid Provider Reimbursement Rate Benchmarks for Key Services*.

New Hampshire Insurance Department. August 11, 2009. *The Impact of Price Transparency on HealthCost Services in New Hampshire*.

Nicholas, L.H., et al. October 2011. “Regional Variation in the Association Between Advance Directives and End-of-Life Medicare Expenditures.” *Journal Of The American Medical Association*, Vol. 306(13): 1447-1453.

O’Reilly D., et al. May/June 2011. “The economics of health information technology in medication management: a systematic review of economic evaluations.” *Journal of the American Medical Informatics Association*, Vol. 19(3): 423–438.

Perkoff, G.T., Kahn, L., and Mackie, A. June 1974. “Medical Care Utilization in an Experimental Prepaid Group Practice in a University Medical Center.” *Medical Care,* Vol. 12(June): 471-485.

Perkoff, G.T., Kahn, L., and Haas, P.J. May 1976. “The Effects of an Experimental Prepaid Group Practice on Medical Care Utilization and Cost.” *Medical Care*, Vol. 14(May): 432-449.

Pinkovskiy, M. October 17, 2013. *The Impact of the Managed Care Backlash on Health Care Costs: Evidence From State Regulation of Managed Care Cost Containment Practices*. Federal Reserve Bank of New York.

Polsky, D., and Nicholson, S. March 2004. “Why are Managed Care Plans Less Expensive: Risk Selection, Utilization, or Reimbursement?” *The Journal of Risk and Insurance,* Vol. 71(1): 21-40.

Peikes, D., et al. February 11, 2009. “Effects of Care Coordination on Hospitalization, Quality of Care, and Health Care Expenditures Among Medicare Beneficiaries, 15 Randomized Trials.” *JAMA*, Vol. 301(6): 603-618.

Pruchno, R.A., et al. 2005. “Spouse as health care proxy for dialysis patients: Whose preferences matter?” *Gerontologist*, Vol. 45(6): 812–819.

Pruchno, R.A., et al. 2006. “Predictors of patient treatment preferences and spouse substituted judgments: The case of dialysis continuation.” *Medical Decision Making*, Vol. 26(2): 112–121.

Public Consulting Group. June 17, 2013. *State of Utah Medicaid Expansion Assessment: Impact Analysis 2014-2023*.

Puente, K. del P., et al. 2014. “Study of the factors influencing the preparation of advance directives,” *Archives of Gerontology and Geriatrics*, Vol. 58: 20–24.

Raskas, R.S., et al. 2012. “Early Results Show WellPoint’s Patient-Centered Medical Home Pilots Have Met Some Goals for Costs, Utilization, and Quality.” *Health Affairs,* Vol. 31(9): 2002-2009.

Rave, N., et al. 2003. “Radical systems change: innovative strategies to improve patient satisfaction.” *Journal of Ambulatory Care Management,* Vol. 26(2): 159-174.

Riley, G.F., and Lubitz, J.D. 2010. “Long-Term Trends in Medicare Payments in the Last Year of Life.” *Health Services Research*, Vol. 45(2): 565-576.

Robert Wood Johnson Foundation. April 2013. *Strengthening Affordability and Quality in America’s Health Care System: 5 Consensus Recommendations from the Partnership for Sustainable Health Care*.

Safran, D.G., Montgomery, J.E., Chang, H., Murphy, J., Rogers, W.H. 2001. “Switching doctors: predictors of voluntary disenrollment from a primary physician’s practice.” *Journal of Family Practice*, Vol. 50(2): 130-136.

Salmon, R.B. 2012. “A Collaborative Accountable Care Model in Three Practices Showed Promising Early Results on Costs and Quality of Care.” *Health Affairs,* Vol. 31(11): 2379-2387.

Schildmann, J., et al. 2012. “Teaching and evaluating breaking bad news: A pre-post evaluation study of a teaching intervention for medical students and a comparative analysis of different measurement instruments and raters.” *Patient Education And Counseling,* Vol. 86(2): 210-219.

Schkade, D., and Kahneman, D. 1998. “Does living in California make people happy? A focusing illusion in judgments of life satisfaction.” *Psychological Science*, Vol. 9: 340–346.

Schneiderman, L.J., et al. 1992. “Effects of offering advance directives on medical treatments and costs.” *Annals of Internal Medicine*, Vol. 117(7): 599–606.

Shalowitz, D.I., Garrett-Mayer, E., and Wendler, D. 2006. “The accuracy of surrogate decision makers: A systematic review.” *Archives of Internal Medicine*, Vol. 166(5): 493–497.

Sherman, P.S. 1998. “Computer-assisted creation of psychiatric advance directives.” *Community Mental Health Journal*, Vol. 34(4): 351-362.

Silveira, M.J., Kim, S.Y., and Langa, K.M. 2010. “Advance directives and outcomes of surrogate decision making before death.” *New England Journal of Medicine*, Vol. 362(13): 1211-1218.

Smith, A.K., Sudore, R.L., and Pe´rez-Stable, E.J. 2009. “Palliative care for Latino patients and their families: whenever we prayed, she wept.” *JAMA*, Vol. 301: 1047-1057, E1.

State Health Access Data Assistance Center (shadac). September 19, 2013. *Uninsurance Rates for Utah in 2011 and 2012*.

Staples, H., and Porter, J. February 2010. *Accountable Care – The Overarching Vehicle for Rehabilitating Health Care – A New Hampshire Perspective*. NH Citizens Health Initiative. Issue Brief.

Sugiyama, T., et al. November 2011. “Implementing Physician Orders for Life-Sustaining Treatment in California Hospitals: Factors Associated with Adoption.” *Journal of the American Geriatrics Society*, Vol. 61(8): 1337-1344.

Szmuilowicz, E., et al. April 2010. “Improving Residents’ End-of-Life Communication Skills with a Short Retreat: A Randomized Controlled Trial.” *Journal of Palliative Medicine*, Vol. 13(4): 439-452.

Szmuilowicz, E., et al. July 2012. “Improving Residents' Code Status Discussion Skills: A Randomized Trial.” *Journal Of Palliative Medicine*, Vol. 15(7): 768-774.

Teno, J.M., et al. April 1993. “Do advance directives save resources?” *Clinical Research*, Vol. 41(2): A551-A551.

Teno, J.M., et al. 1994. “Do formal advance directives affect resuscitation decisions and the use of resources for seriously ill patients?” *Journal of Clinical Ethics*, Vol. 5(1): 23–30.

Teno, J.M., et al. 1997. “Do advance directives provide instructions that direct care?” *Journal of the American Geriatric Society*, Vol. 45(4): 508– 512.

Teno, J.M., et al. 1997. “Advance directives for seriously ill hospitalized patients: Effectiveness with the patient self-determination act and the SUPPORT intervention.” *Journal of the American Geriatric Society*, Vol. 45(4): 500–507.

Teno, J.M., et al. 2004. “Family Perspectives on End-of-Life Care at the Last Place of Care.” *Journal of the American Medical Association*, Vol. 291(1): 88-93.

The Dartmouth Atlas of Healthcare. “End of Life Care.” 2013. Accessed Dec 12, 2013. <http://www.dartmouthatlas.org/data/topic/topic.aspx?cat=18>

The Lewin Group. July 2004, updated March 2009. *Medicaid Managed Care Cost Savings – A Synthesis of Fourteen Studies*. Prepared for America’s Health Insurance Plans.

Tolle, S.W., et al. September 1998. “A prospective study of the efficacy of the physician order form for life-sustaining treatment.” *Journal Of The American Geriatrics Society*, Vol. 46(9): 1097-1102.
Trizetto. 2011. *Value-Based Reimbursement: The Reimbursement Revolution*. White Paper.

Tulsky, J.A., et al. 1998. “Opening the black box: How do physicians communicate about advance directives?” *Annals of Internal Medicine*, Vol. 129(6): 441–449.

Tulsky, J.A. 2005. “Beyond advance directives: importance of communication skills at the end of life.” *Journal of the American Medical Association*, Vol. 294(3): 359-365.

Ubel, P.A. 2006. *You’re stronger than you think*. New York: McGraw- Hill.

Ubel, P.A., and Jepson, C. 2001. “The inclusion of patient testimonials in decision aids: Effects on treatment choices.” *Medical Decision Making*, Vol. 21(1): 60–68.

Upadya, A., et al. 2002. “Patient, physician, and family member understanding of living wills.” *American Journal of Respiratory and Critical Care Medicine*, Vol. 166(11): 1430–1435.

Utah Department of Health. 2012. *2012 Utah Annual Report of Medicaid & CHIP*.

Utah Department of Health, Office of Health Care Statistics. July 1, 2012. *A Snapshot of Clinical Performance by Utah Small Area.”* PowerPoint. Accessed at <http://utahatlas.health.utah.gov/publications.html>.

Utah Department of Health. 2013. *Medicaid Member Guide*.

Volandes, A.E., et al. 2007. “Using video images of dementia in advance care planning.” *Archives of Internal Medicine*, Vol. 167(8): 828– 833.

Wilson, S.E. July 31, 2013. *Economic Perspectives on Utah Medicaid Reform Under the ACA*.

Wright, A., et al. October 2008. “Associations Between End-of-Life Discussions, Patient Mental Health, Medical Care Near Death, and Caregiver Bereavement Adjustment.” *Journal of the American Medical Association*, Vol. 300(14): 1665-1673.

Wrigley, A. 2007. “Personal identity, autonomy and advance statements.” *Journal of Applied Philosophy*, Vol. 24(4): 381–389.

Wrigley, A. 2007. “Proxy consent: Moral authority misconceived.” *Journal of Medical Ethics*, Vol. 33(9): 527–531.

Zhang, B., et al. 2009. “Health Care Costs in the Last Week of Life.” *Arch Intern Med*, Vol. 169(5): 480-488.